



Service News

Volume 1

JANUARY, 1951

Number 1

A SPECIAL MESSAGE

As Americans, we are facing one of the most critical periods in the history of our country, as we build our nation's defenses to safeguard our cherished freedom. During this period the task of the men who install and service Du Mont Telesets will become increasingly important, and difficult to accomplish.

In the span of a few short years, television has been forged into a vitally essential link in the country's communication system. The owners of Du Mont Telesets will rely on their receivers, even more than in the past, as a means of keeping informed of the immediate political, economic, and military events of the troubled world in which we live. They will depend on their Telesets for an unequalled source of the entertainment and relaxation so necessary to all of us in times such as these, as well as for specific information in the event of public emergency.

Faced with shortages of materials and parts, you will be called upon to use all of your knowledge and ability to maintain and improve the high standards and wide public acceptance of Du Mont products, which you, and all of us associated with Du Mont, have helped to create.

We, at the factory, will continue to provide you with complete, up-to-date service information on all Du Mont products. In line with this policy, and in an effort to keep you better informed, we are instituting the publication of a monthly DU MONT SERVICE NEWS. We hope that it will prove helpful to you in your work.

Best wishes and good luck to all of you in the new year.

Ernest A. Marx
General Manager
Receiver Sales Division

ANNOUNCEMENT

This is the first issue of the DU MONT SERVICE NEWS. It will be published monthly and will carry up-to-the-minute service information on all Du Mont Telesets. To obtain the greatest benefit from the SERVICE NEWS, we suggest that you maintain a file of all issues by placing each one in your Du Mont Service Information Binder as it is received. In this way, you will build a source of valuable reference information.

The SERVICE NEWS is available to all the employees of Du Mont Distributors,

Dealers and Authorized Service Organizations. Copies will be sent to all of these organizations without charge. If you are employed by such an organization and would like to have an additional copy sent to your home each month, send \$1.00, your name and address and the name of the organization by which you are employed to:

ALLEN B. DU MONT LABORATORIES, INC.
35 Market Street, East Paterson, New Jersey
Att: Teleset Service Control Department

The Du Mont Teleset Service School

A fully equipped, expertly staffed school, offering a two-week course in Du Mont Teleset servicing, is maintained at the factory. The course is designed to give the experienced technician the training required to make him a specialist in the servicing of Du Mont receivers.

The school is open to all those employees of Du Mont distributors, dealers and authorized service organizations who have had previous television servicing experience. No fees of any kind are

charged and text material is supplied to each student. The course consists of a review of fundamental and practical television theory, and thorough coverage of circuit analysis, signal tracing, troubleshooting, alignment and the use of test equipment with particular emphasis on Du Mont Telesets and Du Mont approved techniques. Students who complete the course with satisfactory grades receive a Certificate of Completion signed by Dr. Allen B. Du Mont.

Continued on Page Seven

SERVICE INFORMATION BINDERS

KEEP YOUR DU MONT SERVICE INFORMATION AT YOUR FINGERTIPS!

Your service notes will be available *when you need them* if placed in one of these sturdily made, easy to use binders. Handsomely bound in green imitation leather, they will give years of useful service.

The following information is included in each binder purchased, without additional charge:

General Notes	•	Spare Parts	•	Policy Letters
RA-109A Notes	•	Installation Notes	•	RA-117A Notes
	•	RA-111A, RA-112A and RA-113 Notes	•	
Tarrytown R C Manual	•	Sherbrooke R C Manual		

Additional service information may be purchased as desired. See your Du Mont distributor for further details.

DU MONT SERVICE BINDER.....\$5.00 EACH

TROUBLESHOOTING HINTS

Teleset: RA-112A — RA-113 —
RA-117A

Symptom: Channel 8 beat. Fine diagonal lines in picture, changing in frequency as fine tuning is varied. Condition occurs in channel 8 areas in those Telesets in which a channel 5 trap has been installed.

Probable Fault: The seventh harmonic (183.75) of the video if (26.25) combines with the video carrier of channel 8 (181.25) to produce a 2.5-mc beat.

Remedy: Connect a 2.5-mmF capacitor from pin 7 of the video detector (V209-A) to ground as shown in figure T-1.

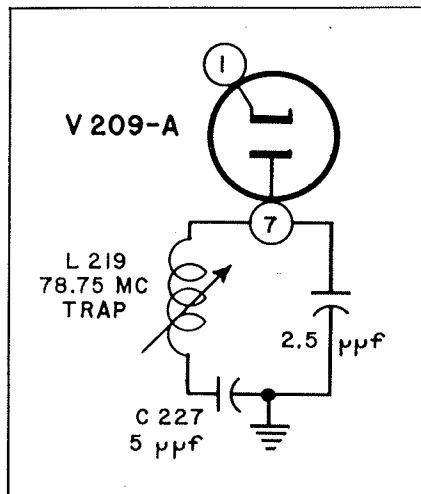


FIGURE T-1

Teleset: All using spiral type Inductuners.

Symptom: Receiver jumps from a high channel to a lower frequency, sometimes to a lower channel.

Probable Fault: L109 in oscillator section of the Inputuner is intermittent or the soldered joint near the inside end of the Inductuner oscillator spiral is defective.

Remedy: Replace or resolder L109, if required, or resolder the inner end of the Inductuner oscillator spiral as described in the troubleshooting hint below.

Teleset: All using spiral type Inductuners.

Symptom: Intermittent snow in picture.

Probable Fault: Poor contact between the inside end of one of the Inductuner spiral coils and its associated contact lug.

Remedy: The following procedure can be used with *extreme caution*, to correct this condition.

1. Remove the four lock nuts holding the top cover of the Inductuner and take off the cover.

Note: In the RA-112A and RA-113 the Inputuner must be removed from the main chassis before step 1 can be accomplished.

2. Tilt the Inputuner chassis so that the shaft of the Inductuner is at an angle of 60° , with the front of the chassis up.
3. Using a 150-watt soldering iron, with a $\frac{1}{4}$ " tip, heat the lug contacting the inner end of each spiral coil, as shown in (2) and (3) of figure T-2. Be sure that your soldering iron is clean and well tinned.
4. After each contact lug is heated, apply a very small amount of solder to the point where the lug and

the spiral meet, as shown in (1) of figure T-2. The solder should be applied near the upper end of the lug and allowed to run down to the spiral. In most cases, the solder already present will be sufficient.

Caution: Care should be exercised to prevent solder from getting on the surface of the spiral. If too much solder is used at the joint, it will cause the "button" on the slider arm to raise and break contact. This will result in loud crackling noise when tuning through channel 7 to 8.

5. After soldering each spiral, wash the soldered areas with carbon tetrachloride and apply a thin coat of Lubriplate 105 (available from your Du Mont distributor).
6. Make a final check of each Inductuner section by checking continuity between each rear lug and its associated slider arm. Since there is a coil shunted across the oscillator spiral, this section will show continuity even if the rear contact lug is not properly contacting the spiral.

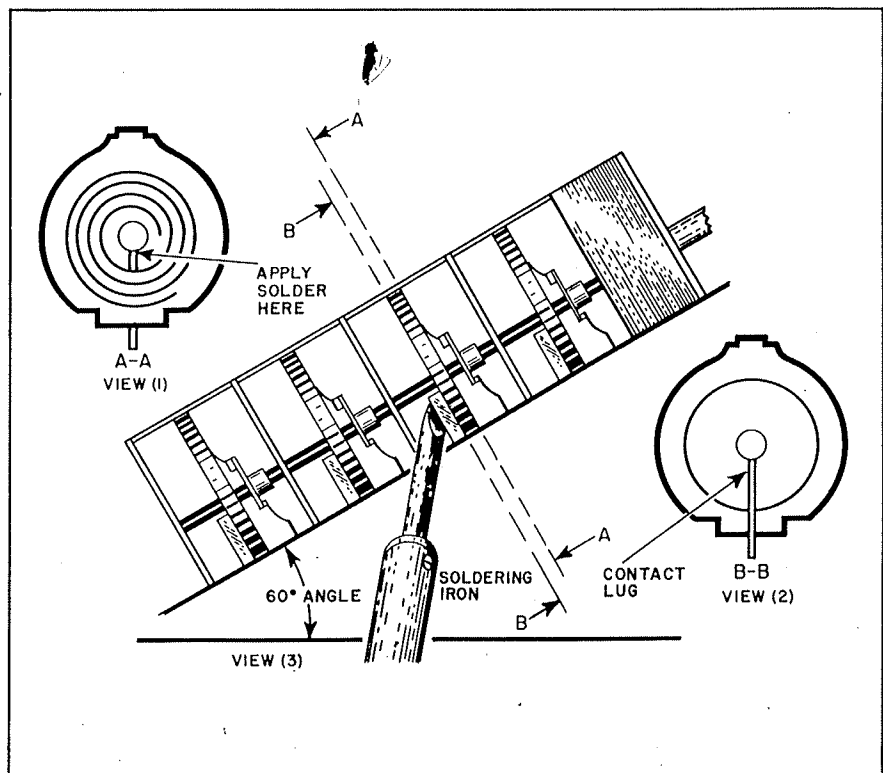


FIGURE T-2

Troubleshooting Hints

Continued from Page Two

Teleset: RA-109A — RA-112A —
RA-113

Symptom: Interference with a-m broadcast receivers, in the form of an audible beat.

Probable Fault: Harmonic radiation of the horizontal sweep signal.

Remedy: The following steps should be followed in the order given. After completing each step, check the results, using an a-m receiver located approximately 25 feet from the Teleset. If the interference is eliminated before the completion of all steps, the remainder of the procedure may be disregarded.

1. Connect a .02-mf, 600-volt capacitor from each side of the line to ground, in the television chassis.

Note: These capacitors may already be incorporated in the Teleset.

2. If the 6W4 heater transformer does not have an electrostatic shield, replace it with one which has. Shielded transformers, in the RA-112A — RA-113 may be recognized by the fifth lead used to connect the shield to the case. In the RA-109A this lead is not visible unless the case is removed. The part number for electrostatically shielded and unshielded transformers is the same; however, shielded transformers will be supplied on all future orders.

Note: Credit will be issued for all unshielded transformers returned in working condition.

Teleset: RA-112A — RA-113

Symptom: No raster, no high voltage. When damper tube is removed, raster, with heavy foldover lines, appears. Raster varies in size, vertically and horizontally when setting of brightness control is changed.

Probable Fault: Breakdown of the .02-mf booster-voltage capacitor.

Remedy: Replace the above capacitor with a 600-volt unit. The symbol number of the capacitor is C291.

Note: 600-volt capacitors are used in all RA-112 and RA-113 chassis currently being produced. The change has been made in all RA-112 chassis starting with serial number 122432.

Teleset: RA-112A — RA-113

Symptom: Horizontal sweep synchronizes only after long warm-up.

Probable Fault: Low emission in the horizontal AFC and saw generator, V214.

Remedy: Replace the above tube.

Teleset: RA-112A — RA-113

Symptom: Poor sensitivity.

Probable Fault: Mixer screen resistor, R109, in the Inputuner has changed value. Proper value is 150K.

Remedy: Replace the above resistor.

Teleset: RA-109A

Symptom: Vertical band, composed of horizontal streaks, located on far right-hand side of the picture. Band appears only when signal is being received and varies with signal conditions.

Probable Fault: Arcing in the 160-mmF capacitor connected across terminals 1 and 3 of the flyback transformer.

Remedy: Replace the above capacitor. The symbol number of the capacitor is C303.

QUESTIONS and ANSWERS

A question and answer department will be a regular feature of the SERVICE NEWS. If you have a problem regarding the servicing of Du Mont Telesets, write to:

ALLEN B. DU MONT LABORATORIES, INC.
35 Market Street, East Paterson, New Jersey
Att: Teleset Service Control Department

Questions of general interest will be answered in the column; others will be answered by letter.

Removing Frozen Deflection Yokes

If a deflection yoke is frozen to the neck of the CRT, it may be removed by applying approximately 50 volts ac, from a variac, to the horizontal winding of the yoke. This will heat and soften the polyethelene sleeve, freeing the yoke.

ERRATA

RA-109A Service Notes

Page 109-5S, step 5 should read . . . "a 2.7K, 1/2W resistor".

Page 109-6K, line 5 should read:

L401 21005711 Yoke Deflection

RA-112A — RA-113 Main Chassis Schematic Sheet

Second Edition 10/2/50

1. Extend contact lug 1 of S201 so that it remains in contact with the switch segment in the FM (No. 3) position.
2. Change the designation of V211 to read:
19AP4A — RA-112A
17AP4 — RA-113
(per Production Change No. 12)

RA-112A — RA-113 Service Notes

Pages 112-6J and 112-6K:

The part number of C291 should read 03101550, not 03015550.

RA-117A Main Chassis Schematic Sheet

First Edition 11/8/50

1. Add arrow from S201, lug 3 to —50-volt box.
2. In the RA-117A main chassis parts list, the first line should read:
C201 03015610 Cap Ce 5000 mmf

PRODUCTION CHANGES

All subsequent issues of the DU MONT SERVICE NEWS will carry information describing production changes made in Telesets since the publication of each preceding issue. To obtain maximum benefit from this information, we suggest that the technician note these changes on his schematic diagram of the Teleset involved. In this way his schematic will always be up-to-date.

Consistent with past policy, revised schematics will be issued when a sufficient number of changes have been made.

RA-109A

Change No. 35 (ECN-4584)

Reason:

To improve interlace.

Procedure:

1. Ground the shield surrounding the narrow band sync section to the main chassis, using a piece of braid.
2. Add a tube shield over 6SN7 (V219).
3. Remove C256, connected from the green lead of T201 to V219 pin 4, and replace it with a shielded jumper with its shield grounded.
4. Insert a .01-mf capacitor between the junction of R293, R295 and C255 and the yellow lead of T201. The new component should be labeled C256.
5. Disconnect the end of R295 connected to V219 pin 4 and reconnect it to the junction of R293 and C255.
6. Remove the lead running between the junction of R294, R379 and the brown lead of T201 from -12V, and connect the junction to ground.
7. Delete C288-C connected from V220, pins 3 and 6, to the junction of R301, R299 and -12V.
8. Remove the junction of R301 and R299 from -12V and connect it to ground.
9. Connect C331, a 25-mf, 50V capacitor, between the junction of R297, V220 pin 6, and R300 to ground.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C256	03101540	Cap Pa .01 mf 5% 600V
C331	03013890	Cap E 25 mf 50V

This change has been incorporated in all chassis starting with the serial number shown below:

RA-109A — No. 0942927

Change No. 36 (ECN-4720)

Reason:

Shortage of tubes.

Procedure:

Change V102, the mixer in the Inputuner, from a 6AK5 to a 6BC5.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
V102	25002020	Tube Elec 6BC5

All RA-109A chassis incorporating this change are stamped "L".

Change No. 37 (ECN-4738)

Reason:

To reduce "hook" and "whip" due to video in sync circuits.

Procedure:

Change the value of R359, from 270 ohms 10% 1/2W to 470 ohms 10% 1/2W.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R359	02031730	Res F C 470 ohms 10% 1/2W

All chassis starting with the serial number shown below incorporate this change. Earlier chassis so modified will be stamped 4738 on the back of the chassis.

RA-109A — No. 0944418

RA-112A

Change No. 34 (ECN-4504)

Reason:

Due to a shortage of 6AH6 electron tubes, it has been found necessary to make the following change.

Procedure:

1. Rewire V210 as shown in figure P-1.
2. Replace V210, 6AH6 with 6AC7.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
V210	6AC7	Tube Elec 6AC7

All chassis incorporating this change are stamped "S" on the back of the chassis. The chassis first incorporating this change is:

RA-112A — No. 1232254

RA-112A — RA-113

Change No. 35 (ECN-4658)

Reason:

To reduce over-all sound regeneration.

Procedure:

Add C274 between the junction of R262 and C277, and ground.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C274	03015610	Cap F Ce 5000 mmf min

This change has been incorporated in all chassis starting with the serial numbers shown below:

RA-112A — No. 1225292

RA-113 — No. 1328287

Change No. 36 (ECN-4686)

Reason:

To provide a video output jack to permit future use of a color converter.

Procedure:

1. Change the present Phono Bracket to the Phono and Video Bracket.

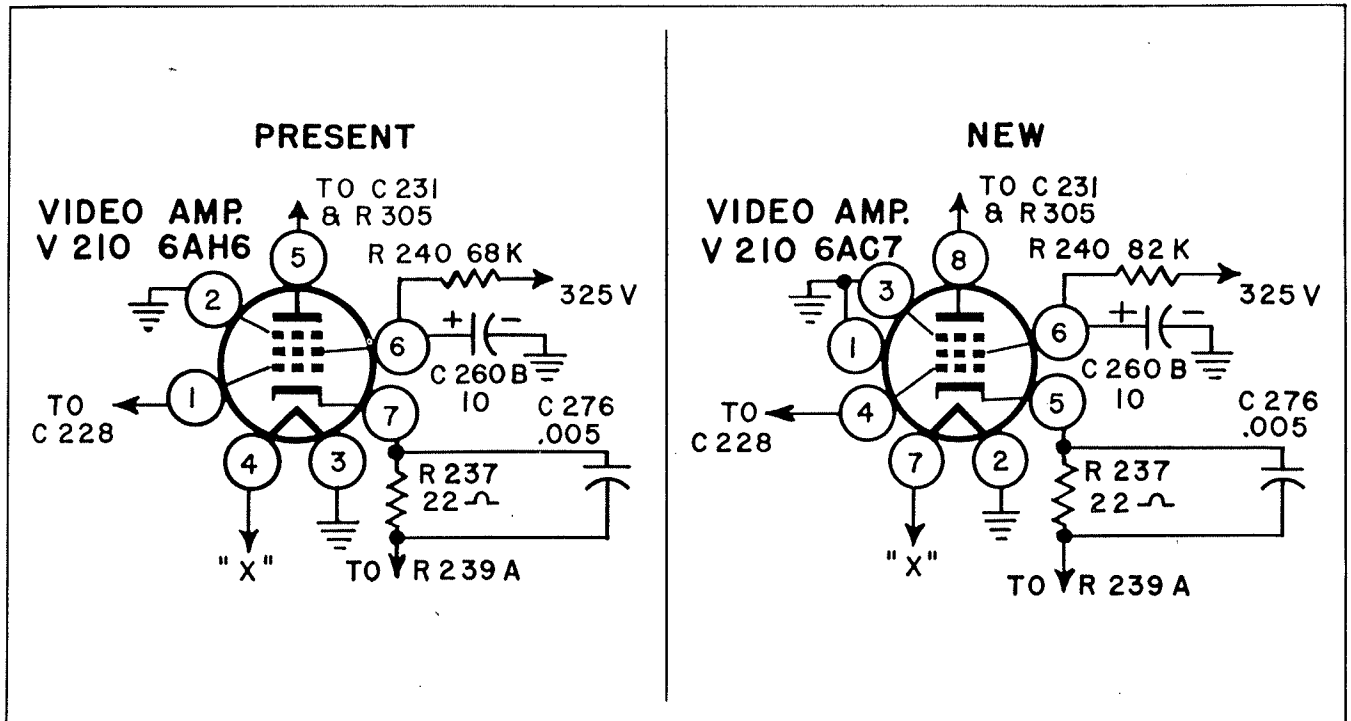


FIGURE P-1

2. Mount Phono and Video (J205) female connectors on Bracket.
3. Connect C225 to the center conductor of J205 (the female video connector) and the junction of R237, R239-A and C276.
4. Ground the external contact of J205.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
	35011861	Bracket Phono and Video
J205	09002760	Conn. Female 1 contact
C225	03014770	Cap Pa .1 mf 20% 400V

All chassis modified are stamped "T" on the back of the chassis. The first chassis to incorporate this change are:

- RA-112A — No. 1235261
- RA-113 — No. 1333854

Change No. 37 (ECN-4720)

See Change No. 36 under RA-109A for details. All RA-112A and RA-113 chassis incorporating this change are stamped "U".

Change No. 38 (ECN-4738)

See Change No. 37 under RA-109A in this issue. The parts information differs from that in the RA-109A and is shown below:

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R315	02031730	Res F C 470 ohms 10% 1/2W

The first chassis incorporating this change are:

- RA-112A — No. 1237485
- RA-113 — No. 1342059

RA-116A

Change No. 1 (ECN-4720)

See Change No. 36 under RA-109A in this issue. All RA-116A chassis incorporating this change are stamped "L".

RA-117A

Change No. 1 (ECN-4686)

See Change No. 37 under RA-112A in this issue.

Change No. 2 (ECN-4738)

See Change No. 37 under RA-109A in this issue. The parts information differs from that in the RA-109A and is shown below:

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R315	02031730	Res F C 470 ohms 10% 1/2W

This change has been incorporated in all chassis starting with the serial number shown below:

- RA-117A — No. 173709

Change No. 3 (ECN-4669)

Reason:

To reduce buzz when Phono-TV Switch S201-3 is in the Phono position.

Procedure:

Connect a jumper between pin 3 of the Phono-TV Switch S201-3 and -50 volts at the junction of R292 and R299.

PARTS LIST CHANGES

Each issue of the DU MONT SERVICE NEWS will carry parts information covering all changes made in Du Mont Telesets since the previous issue. Although revised parts lists are issued periodically, it is suggested that the technician note the changes shown here on his copy of the current parts list. In this way he will always have up-to-date parts-list information available.

RA-109A

Main Chassis Parts List

Changes since the 3rd Edition of the Service Sheets

Delete:

F202

Add:

F202	11000720	Fuse Cart. 1/4 amp
L217	21004601	Heater Choke
R386	02031990	Res F C 68K 10% 1/2W

Miscellaneous Parts List

Delete:

L401 Deflection Yoke

Add:

L401	21005711	Yoke Deflection
	21006641	

RF Tuning Assembly Parts List

The RF Tuning Assembly has been changed in the RA-109A from the Continuous Tuning type to the Skip-Band Tuning type used in RA-116A Telesets. The part number for this assembly is 89003011.

RA-112A

Miscellaneous Parts List

Delete:

L206 Yoke Deflection
Loudspeaker Assy

Add:

L206	21005711	Yoke Deflection
	21006641	
	18002794	Loudspeaker Assy
	18003063	

RA-113

Miscellaneous Parts List

Delete:

Loudspeaker Assy
Mask Assy

Add:

18002791	Loudspeaker Assy
18003062	
64003545	Mask Assy

RA-112A — RA-113

Miscellaneous Parts List

Add:

30016741	Horizontal Hold Drag Spring
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Main Chassis Parts List

Changes since the 2nd Edition of the Service Sheets

Delete:

C280	R307
C288	R308
F202	R317
L213	Z210
R294	

Add:

C213	03055680	Cap F Ce 100 mmf 10% 500V
C280	03016896	Cap Coupling
C288	03018470	Cap F Pa .02 mmf 20% 200V
C299	03055510	Cap Var Ce 8-50 mmf 350V
F202	11000720	Fuse, Cart. 1/4 amp
R294	02034190	Res F C 910K 5% 1W
R307	02037770	Res F C 1K 10% 2W
R317	02035560	Res F C 220K 20% 1/2W
	02045560	
	02055560	
Z210	20005571	Transformer Hor. Osc.

RA-116A

Main Chassis Parts List

Changes since the 3rd Edition of the Service Sheets

Delete:

F202

Add:

F202	11000720	Fuse Cart. 1/4 amp
L217	21004601	Heater Choke
R386	02031990	Res F C 68K 10% 1/2W

Miscellaneous Parts List

Delete:

L401

Add:

L401	21005711	Yoke Deflection
	21006641	

Repairing Defective RA-109A Horizontal Output Transformers

If the high-voltage coil in the horizontal output transformer of an RA-109A is found to be defective, it is not necessary to replace the complete transformer. Replacement high-voltage coils are available. The part number of the replacement is 20005721. Complete installation instructions are included with the part.

Substituting The 17BP4A CRT For 17AP4 In RA-113

The 17BP4A may be substituted directly for the 17AP4 in the RA-113. The suffix "A" indicates external conductive coating. Since the 17AP4A is slightly longer than the 17AP4, the back cover of the Teleset may interfere with the CRT socket wiring. This condition may be remedied by repositioning one or two of the cover screws to permit the cover to bulge outward slightly.

Horizontal Sync Problems

On occasion, the technician will encounter an RA-109A, RA-112A, RA-113 or RA-117A Teleset in which the horizontal sync is unstable. The effects on the picture and the remedies required are identical for the RA-112A, RA-113 and RA-117A Telesets. In the RA-109A the horizontal sync circuits are somewhat different; therefore, the indications, as observed on the picture tube screen, and the remedies required are sometimes different.

RA-109A Picture "Wobble" or "Jitter"

Picture "wobble" or "jitter" is a condition peculiar to the RA-109A. It also manifests itself as a floating back and forth of the picture. The cure for this condition is discussed in the RA-109A Service Notes on page 109-5P.

"S" Distortion

Another effect of unstable sync, which occurs in all of the receivers mentioned, results in a horizontal movement of the picture which, in extreme cases, is an "S" shaped distortion of the picture, as shown in figure H-1. This condition has been confused with wobble or jitter, as described above, and the technician should study the picture carefully to make certain he has analyzed the trouble correctly.

This distortion is usually caused by heater to cathode leakage in the 6J6 r-f amplifier in the Inputuner. The tube should be checked and replaced, if necessary, before proceeding to examine the horizontal sync circuits.

"Pulling" and "Wobble"

This condition is also referred to as "hook" and "whip" and occurs in RA-109A, RA-112A, RA-113 and RA-117A Telesets. It results in horizontal pulling of a portion of the picture, generally about one inch wide. This pulling is caused by the video signal entering the sync circuits. It can be corrected by changing the value of the by-passed cathode resistor, in the narrow-band sync stage, from 270 ohms to 470 ohms. The symbol number of this resistor is R359 in the RA-109A, and R315 in RA-112A, RA-113 and RA-117A Telesets. This change has been incorporated in all chassis starting with the serial numbers shown below:

RA-109A — No. 0944418
 RA-112A — No. 1237485
 RA-113 — No. 1342059
 RA-117A — No. 173709

If the difficulty persists, short R284 in the sync detector output. Since this

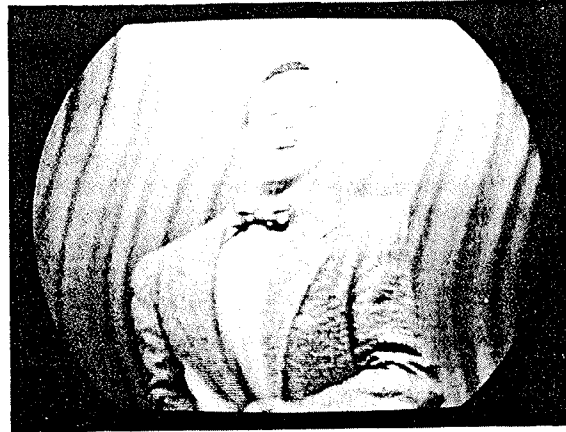


FIGURE H-1. "S" DISTORTION

will reduce noise immunity, it is not advisable in noisy areas.

Other Problems

Several other production changes have been made recently to minimize the possibility of horizontal sync difficulties. These changes and the identification of the chassis incorporating them are as follows:

1. C246, the .01-mf capacitor connected across the horizontal oscillator transformers in RA-112A, RA-113 and RA-117A Telesets, has been changed to an oil-filled type to reduce the possibility of frequency drift. Such drift might make it impossible to sync the picture using the front hold control. The part number of the new capacitor is 03101540.

2. In order to obtain greater sync-pulse amplitude for application to the horizontal-sync circuits in RA-112A and RA-113 Telesets, the plate-load resistor of the second sync clipper has been moved from the +35-volt line to the +75-volt line. This change minimizes the possibility of frequency drift which might make it impossible to sync the picture using the front hold control. It is accomplished by disconnecting the white lead between R288 and C229-C, at C229-C, and reconnecting it to C229-B. The first chassis in which this change occurred are RA-112A, No. 1222446 and RA-113, No. 1324258.

Proper adjustment of the horizontal sync circuits is important if synchronization difficulties are to be avoided. Instructions are given in the troubleshooting and adjustment sheet for each Teleset. The instructions call for the use of a 10-mmF capacitor to isolate the oscillograph when making adjustments. If this capacitor is not available, it is permissible to connect the oscillograph lead to the body of the 8.2K resistor (R260), provided the lead is kept perpendicular to the body of the resistor.

Many customer complaints of difficulties with horizontal synchronization can be traced to insufficient instruction of the customer in the operation of his Teleset. Make sure that he knows how to adjust the horizontal hold control and understands the conditions under which readjustment may be necessary. Careful attention to this detail will eliminate many unnecessary service calls. The adjustment procedure is covered in the RA-112A—RA-113 section of the Service Notes, page 112-5K, dated 11/30/50.

The Du Mont Teleset Service School

Continued from Page One

Applications are accepted in order of receipt except for those from newly authorized organizations, in which case every effort is made to secure immediate openings.

Du Mont maintains this school, at considerable expense, because past experience has proven that specialized instruction of service personnel is necessary if they are to operate at maximum efficiency. Dealers and service organizations whose personnel have attended the school find that, as a result of the increased efficiency of their technicians, they are able to reduce their service costs and increase the number of their satisfied customers.

If you haven't already taken advantage of the school, investigate it now. The Teleset Service Control Department will be happy to arrange accommodations in near-by hotels or at the YMCA for all out-of-town students. For further information, address:

ALLEN B. DU MONT LABORATORIES, INC.
 35 Market Street, East Paterson, New Jersey
 Att: Mr. E. W. Merriam, Manager
 Teleset Service Control Department

BENCH CABLES

The chart below lists the cables required to operate Du Mont Telesets on the bench. These cables are longer than those normally supplied with the set and permit the chassis

to be set up and operated on the bench for servicing purposes. They may also be used to advantage when servicing a Teleset in the customer's home.

TELESET	CRT BASE TO MAIN CHASSIS	YOKE AND FOCUS COIL TO MAIN CHASSIS	POWER SUPPLY TO MAIN CHASSIS	POWER SUPPLY TO MAIN CHASSIS
RA-104A	50041101	50014161, 6 ft. ext.	50014171, 6 ft. ext.	50017301
RA-105A	"	" " "	" " "	50014181, 6 ft. ext.
RA-105B	"	" " "	" " "	" " "
RA-106A	"	" " "	" " "	" " "
RA-108A	"	" " "	" " "	" " "
RA-109A	"	* " " "	None required	None required
RA-110A	"	" " "	Same as RA-104A	Same as RA-104A
RA-112A	"	† " " "	None required	None required
RA-113	"	† " " "	" "	" "

Many service shops have a 15" CRT bench set-up for servicing the RA-105A, RA-105B, RA-106A and the RA-108A. These Telesets use eight-conductor cables between the main chassis and the deflection yoke and focus coil. In

order to adapt the existing bench set-up for servicing the RA-112A and RA-113, which use different plugs (nine pin), an adapter cable is required. Specifications for this adapter cable are given below.

OCTAL PLUG, FEMALE	9 PIN PLUG, MALE	INSULATION COLOR
Pin #2	to Pin #1	† Yellow
Pin #6	to Pin #2	† Black
Pin #7	to Pin #4	† Red
Pin #5	to Pin #5	** Blue
Pin #4	to Pin #7	** White
Pin #3	to Pin #9	** Orange

* Cable assembly 50014161 should be used with the adapter described on page 109-5J of the Service Notes.

† Cable assembly 50014161 should be used with cable adapter described above this note.

‡ Wire to be AWG 22 stranded.

** Wire to be 7/28 AWG, T.C.W., Insulation Vinylite #VG-5509, min. wall thickness 1/32".

VIDEO PEAKING COIL CHARACTERISTICS

PART NUMBER	INDUCTANCE IN MILLIHENRIES ± 5%	DISTRIBUTED CAPACITANCE IN MICROMICROFARADS	COLOR*	EFFECTIVE Q	RESISTANCE IN OHMS
21004461	495	3.0	Red	50 at 1.0 mc	11.6
21004462	153	3.0	Blue	50 at 1.0 mc	8
21004463	165	3.0	White	50 at 1.0 mc	6.0
21004464	193	3.0	Green	50 at 1.0 mc	6.2
21004465	22	3.0	Orange	50 at 2.0 mc	1.8
21004466	210	3.0	Brown	50 at 1.0 mc	
21004467	360	3.0	Yellow	50 at 1.5 mc	6.2
21004468	237	3.0	Violet	50 at 1.0 mc	1.2
21004469	124	3.0	Grey	50 at 1.0 mc	
21006621	22	3.0	Black	30 at 2.0 mc	2.8
21006622	105	3.0	Brown	30 at 1.0 mc	6.5
21006623	139	3.0	Red	30 at 1.0 mc	7.7
21006624	165	3.0	Orange	30 at 1.0 mc	1.8
21006627	360	3.0	Blue	30 at 1.5 mc	14.2
21006629	495	3.0	White	30 at 1.0 mc	

* The identifying colors on the 2100446-series consists of a small dot located at one end of the coil. The identifying colors for the 2100662-series are in the wax used to impregnate the coil.

Eliminating Horizontal Pull

An article on horizontal-sync problems was published in the January issue of the SERVICE NEWS. One of the problems discussed results in an effect referred to as horizontal "pulling" or "wobble" as shown in Figure A-1.

Fundamentally the problem is due to an improper sync-to-video ratio in the transmitted signal. This condition occurs as a result of over-modulation of the transmitted signal.

All current Du Mont Telesets are designed for maximum sync-noise immunity. Under noisy receiving conditions, when other television receivers will jump sync, the picture on a Du Mont receiver will remain steady. To achieve this superior noise immunity, it is necessary to clip the sync pulses close to the pedestal or black level. If over-modulation occurs at the transmitter, the black level will extend into the sync region; consequently a portion of the video signal will be clipped with the sync pulses and will reach the input of the horizontal saw generator causing pulling or wobble in the picture. The immunity of a Teleset to the effects of over-modulation can usually be increased by aligning the narrow-band sync transformer, using the following procedure.

1. Turn the Teleset on and tune it to a station, preferably one on which horizontal pulling occurs.
2. Connect an oscillograph to the plate of the first sync-amplifier stage.

Note: An oscillograph with good high-frequency response such as the Du Mont 224 or 241 should be used. The Du Mont 304H may be used although the results obtained may not be as accurate.

3. Adjust the frequency controls on the oscillograph to obtain a complete field on its screen; that is, two

vertical sync pulses as shown in figure A-2.

4. Set the contrast and brightness controls to obtain a normal picture and adjust the a-g-c control until the picture brightens up. This will usually cause video to appear at the plate of the first sync amplifier, as shown in figure A-2.
5. Vary the adjustments at the top

and bottom of the narrow-band sync transformer until the video in the sync is eliminated, as observed on the oscillograph. When this adjustment has been made properly, the oscillograph pattern should appear as shown in figure A-3.

6. Repeat step 4 causing the video to again appear in the output of the first sync amplifier and repeat step

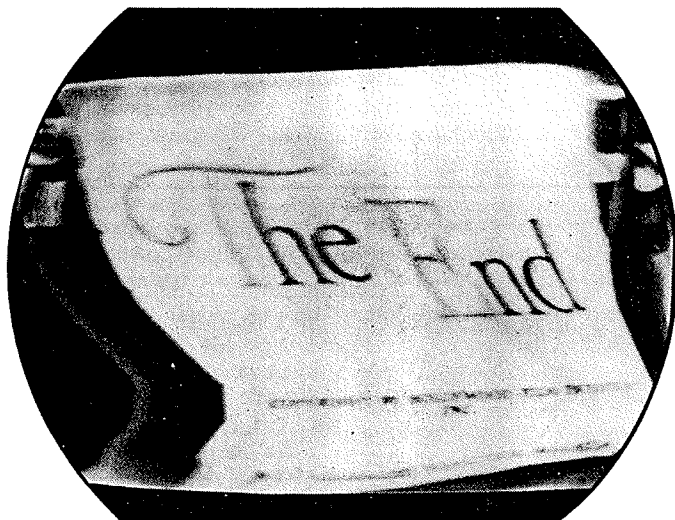


Figure A-1. Horizontal pull.

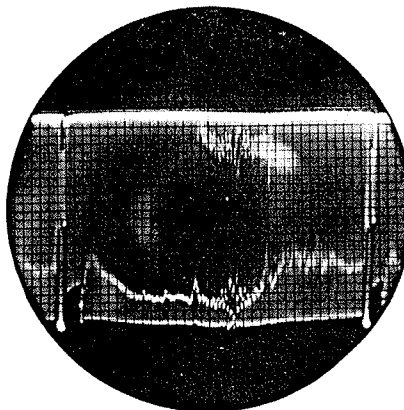


Figure A-2. Output of first sync clipper showing video in sync.

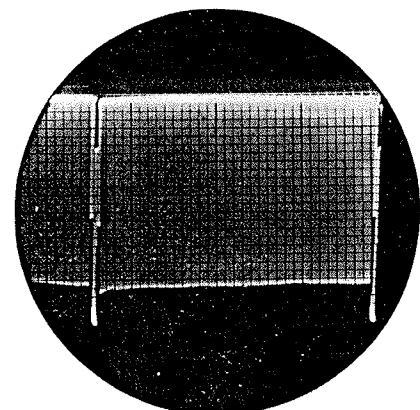


Figure A-3. Output of first sync clipper with narrow-band transformer properly adjusted.

5 to eliminate it. Continue repeating steps 4 and 5 until it is no longer possible to eliminate the video in the output of the first sync amplifier by tuning the narrow-band sync transformer.

After this procedure has been completed, a greater range of a-g-c adjustment, without horizontal pulling, will be available.

When installing the Teleset, adjust the a-g-c control by turning it first in one direction until a point is reached where pulling starts to occur. Then turn the control in the opposite direction until the point is reached where pulling again occurs. Set the control mid-way between these two points. If both weak and strong signals are received at the location where the Teleset is installed, the adjustment should be made carefully to prevent a reduction in sensitivity on weak stations.

Recently, a production change was made in all Telesets to reduce the possibility of pull and wobble. This change consisted of replacing the un-bypassed 270-ohm resistor in the cathode circuit of the 6BA6 narrow-band sync amplifier with a 470-ohm unit.

If the receiver experiencing the difficulty does not already include the 470-ohm resistor, the change should be made.

*If changing the above resistor and readjusting the narrow-band sync transformer does not completely eliminate the horizontal pulling, short the 10K resistor (R284) located in the output of the sync detector. This permits the signal to produce a larger bias across C249, the coupling capacitor. The increased bias depresses the pedestal and video level of the signal to below cutoff. This prevents the video signal from entering the sync circuits and eliminates the horizontal pulling.

Unfortunately, when R284 is shorted, the noise immunity of the Teleset is somewhat impaired. With R284 in the circuit, the discharge path of C249 is through R284 and the grid-to-cathode resistance of V219. The time constant, which exists under these conditions, is such that frequencies higher than those involved in a satisfactory sync pulse are attenuated. Since most noise occurs at these higher frequencies, a considerable improvement in noise immunity is obtained. When R284 is shorted out, only the grid-to-

cathode resistance of V219 remains in the discharge path of C249. As a result the time constant of the coupling circuit is changed, permitting noise signals to develop greater amplitudes at the grid of V219. Consequently noise pulses are able to drive the grid beyond cutoff which results in loss of sync. From the above discussion it is obvious that if a Teleset displays horizontal pull due to over-modulation at the transmitter, resistor R284 should not be shorted unless the noise level is low enough to allow satisfactory sync locking with the resistor out of the circuit. To enable the technician to perform this operation conveniently, two jacks have recently been added to all chassis. Size 12 wire should be used as a jumper between these jacks. This change has been incorporated in all Telesets starting with the serial numbers listed below.

RA-112A—No. 1252325—coded AC
RA-113 —No. 1351175—coded AC
RA-117A—No. 1710886—coded E
RA-109A—No. 0952654—coded M
RA-116A—No. 16276 —coded M
See Production Changes in this issue.

Du Mont Teletron Warranty

From time-to-time the Teleset Service Control Department receives questions regarding the warranty of Du Mont Teletrons. The information which follows is given in the hope that it will clarify the terms of the warranty for those readers who do not have a clear understanding of them.

As you know Du Mont Teletrons are sold as part of new Telesets and separately, for replacement and other purposes. Cathode-ray tubes in new Telesets and those sold separately are covered by different warranties. As of November 1, 1950, the warranty for tubes sold for replacement or other purposes was changed. Such tubes are warrantied to be free from defects in workmanship and material under normal use and operating conditions. Du Mont, at its own expense, will repair or replace any tube sold by it which shows such defects within six months from its factory shipment date, under the conditions set forth in the "War-

ranty on Television-Type Cathode-ray Tubes."

The warranty on cathode-ray tubes in *new Du Mont Telesets* has not been changed. These tubes are warrantied for one year from the date of purchase of the Teleset, under the conditions set forth in the "Warranty for Your Du Mont Teleset and Teletron"; mailed to each purchaser of a Du Mont Teleset. If the tube in a new Teleset shows a defect 10 months after the Teleset is installed it will be replaced. If the replacement shows a defect three (3) months later the customer must pay for a new tube, since the tube became defective one month after the expiration of the warranty period.

Troubleshooting Hints

Teleset: All

Symptom: Flashing on screen.

Probable Fault: The cover of the yoke connector is intermittently contacting the focus-coil case. While both

are grounded, there is enough potential difference between them to cause the above difficulty.

Remedy: Redress the yoke cable.

Teleset: RA-116A

Symptom: Tape breaks when starting or stopping the Tape Recorder.

Probable Fault: One or both of the take-up drive clutch assemblies are too tight. This difficulty usually occurs in the first month or two of operation, during which time the clutch pressure may gradually increase.

Remedy: Readjust the clutch pressure as described in the Tape Recorder Manual.

Teleset: RA-116A

Symptom: The tape recorder's re-winding speed is too slow.

Probable Fault: One or both of the take-up drive clutch assemblies are too loose. This difficulty usually occurs in the first month or so of use.

Remedy: Readjust the clutch pressure as described in the Tape Recorder Manual.

Re-calibrating the RA-117A Tuner

Aging of components or replacement of the oscillator tube in the Selectuner may cause the proper tuning point, for each channel, to fall out of the range of the detent. When this condition is encountered, the following procedure should be followed to correct it:

1. Turn the Teleset on and tune it to the highest channel in use in the area in which it is installed.
2. Remove the tuning knob and the channel indicator dial and readjust the tuning until proper tuning indication is obtained.

Caution: Do not carry or tune the Selectuner using the channel indicator dial.

3. Observe the position of the detent for the channel to which the Teleset is tuned, with respect to the detent spring, C in figure S1. The detent spring should be centered in the proper detent.

Note: With proper calibration the clutch stop (A) will not necessarily be centered when the Teleset is tuned to channel 9. Therefore, it is not advisable to use this channel as a reference.

4. If the position of the detent is incorrect, loosen the two Phillips screws (D) on the front of the clutch disc one-half turn; while holding the detent disc in position.

Caution: Do not disturb the Phillips screws fastening the top section of the Selectuner to the Inductuner.

5. Rotate the detent disc until the detent spring is centered in the proper detent.
6. Rotate the clutch disc until the stop is centered in the slot, when the tuning indicator shows proper tuning.
7. Tighten the two Phillips screws and make a final check of the dial calibration on all stations.

If it is impossible to obtain proper calibration on all stations using the above procedure, the oscillator tracking adjustment may be off or the gear train in the tuner may have been damaged. A quick check of the calibration may be made by tuning to channel 13. If the gear train is properly engaged and the calibration is approximately correct, the flat (E) on

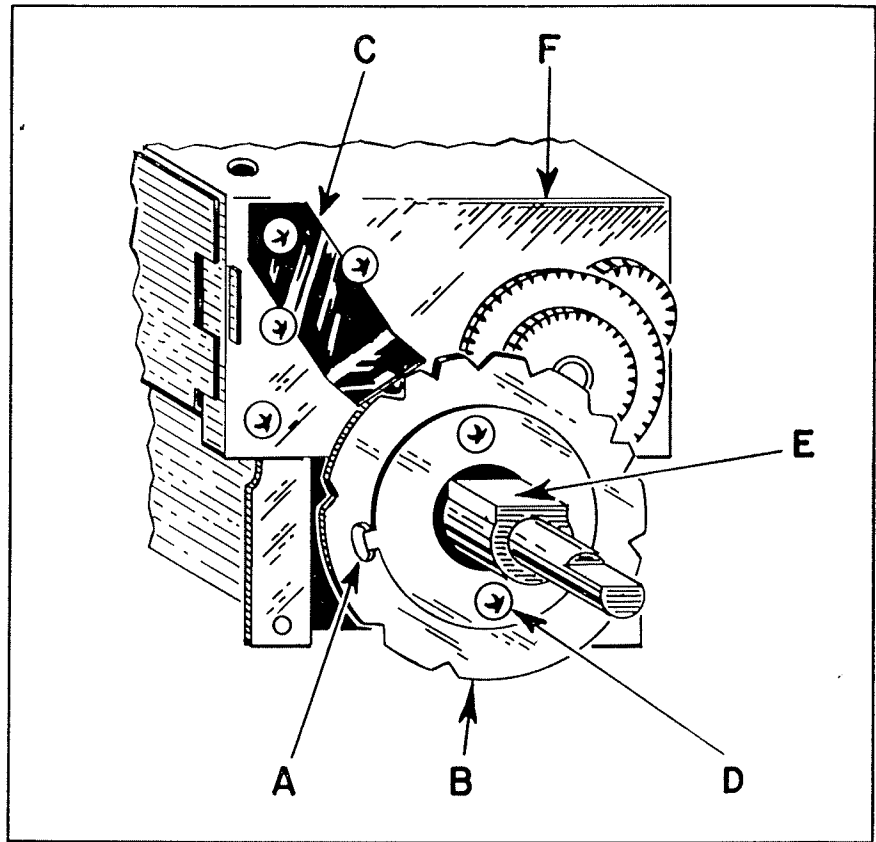


Figure S-1. RA-117A Selectuner.

the shaft, extending through the detent disc, will be up and approximately parallel with the top of the chassis (F). Damage to the gear train can result if the channel indicator dial is used as a knob. The gear train in the Selectuner is sturdily constructed and will give long, trouble-free perform-

ance in normal usage; however, some possibility of damage to the gear train exists if sufficient turning force is exerted on the channel indicator dial.

If the gear train in the Selectuner has been damaged, the unit should be returned to your distributor for exchange.

Filters and Traps Available

The following filters and wave traps, for use with Du Mont Telesets, are now available.

USE	TYPE	PART NUMBER
FM trap	88-108mc	
	Straight type for RA-103C, D, 104A & 110A	21005881
	L type for RA-105A, B, 106 & 108A	21005891
<i>(See page INS-10B in the Service Notes.)</i>		
FM filter	88-108mc, "M" derived band elimination filter	88000301
<i>(See page INS-10E in the Service Notes.)</i>		
Amateur band filter	High-pass filter, cut off at 40mc	88000331
<i>(See page INS-11 in the Service Notes.)</i>		
Channel 5 trap	Tweet trap for RA-112A — 113	21007131
<i>(See page 112-5i in the Service Notes.)</i>		
Channel 5 trap	Tweet trap for RA-104A — 110A	21005411
Horizontal sweep radiation filter	Low-pass filter	21007021
<i>(See Troubleshooting Hints in this issue.)</i>		

PRODUCTION CHANGES

RA-109A

Change No. 38 (ECN-4676)

Reason:

Resistor R238 was changed from a half-watt to a one-watt unit to eliminate the possibility of breakdown due to overheating.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R238	02034990 02044990 02054990	Res F C 68K 10% 1W

The first chassis to incorporate this change was:
RA-109A — No. 0949049

Change No. 39 (ECN-4683)

Reason:

The addition of a video output jack to provide for use of the receiver with a color convertor.

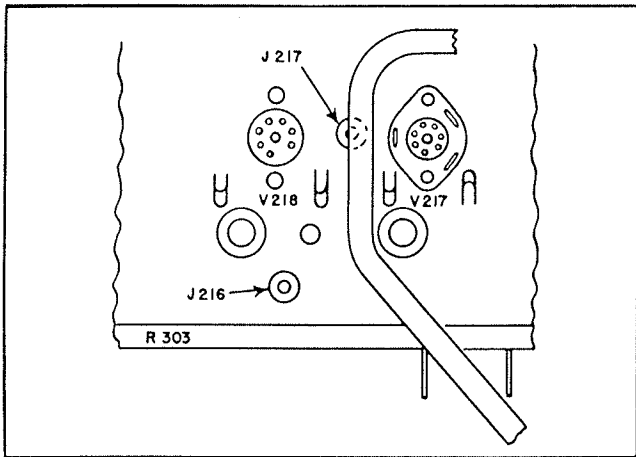


Figure P-1. Change No. 41, RA-109A.

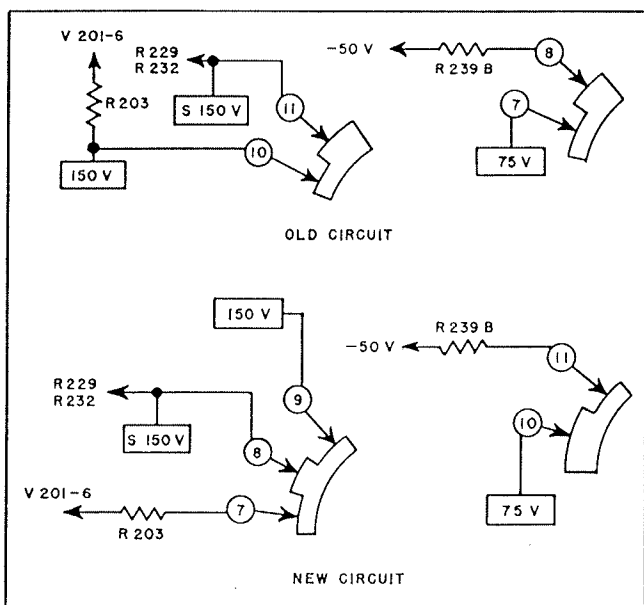


Figure P-2. Change No. 39, RA-112A - RA-113.

Procedure:

1. Mount J209 near V213.
2. Ground outer conductor of J209.
3. Connect C338 between V213-7 and the inner conductor of J209.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C338	03019260	Cap F Pa .1 mf 20% 400V
J209	09002760	Connector female 1 contact

The first chassis to incorporate this change was:
RA-109A — No. 0943922
All chassis so modified are coded "K".

Change No. 40 (ECN-4798)

Reason:

To improve the effectiveness of the narrow-band sync and a-g-c stages. This is accomplished by a redesign of Z210, the narrow-band sync transformer. The new transformer has a higher secondary to primary turns ratio and a higher L/C ratio than the former part. As a result the transformer gain is greater. Since the new transformer has a higher Q, a larger load resistor is required. To maintain the same RC ratio obtained with the previous transformer, C306 has been changed.

Procedure:

1. Change Z210
2. Change R275
3. Change C306

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C306	03015790 03020350	Cap F Ce 20 mmf 10% 500V
R275	02031940 02041940 02051940	Res F C 27K 10% 1/2W
Z210	20006231	Trans narrow band sync

The first chassis to be so modified was:
RA-109A — No. 0952654
All chassis so modified are coded "M".

Change No. 41 (ECN-4809)

Reason:

To reduce horizontal pulling, two jacks are provided as described in the article entitled "Eliminating Horizontal Pull," in this issue.

Procedure:

Mount the two jacks, J216 and J217 as shown in figure P1.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
J211	09019870	Connector female 1 contact
J217	Same as J216	

This change was first incorporated in chassis:
RA-109A — No. 0952654
All chassis so modified are coded "M".

RA-112A — RA-113

Change No. 39 (ECN-4529)

Reason:

To eliminate f-m pickup when the Teleset is being used for phonograph reproduction. This pickup occurs in areas where very strong f-m signals are present and is coupled to the first sound amplifier through the stray capacitance of S201. A position is added to this switch to remove the B+ from the screen of the first sound i.f., V201.

Procedure:

Replace and rewire S201 as shown in figure P2. Connections not shown remain the same.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
S201	05004511	Switch Service Selector

The first chassis to incorporate this change are listed below:
 RA-112A — No. 1239006
 RA-113 — No. 1343368
 All chassis so modified are coded "A-A".

Change No. 40 (ECN-4690)

Reason:

To obtain maximum sensitivity when receiving f-m stations in areas where both extremely strong and weak signals are received. If both strong and weak f-m signals are present at the antenna terminals of the Teleset, it is possible for a strong signal to reduce the gain of the receiver when it is tuned to a weak signal. When this occurs, the reduction in gain may be sufficient to make satisfactory reception of the weak signal impossible.

The above condition can occur if a strong signal is close enough in frequency, to a weak signal so that both signals fall within the pass band of the r-f and video i-f stages, when the receiver is tuned to the weak signal. The strong signal will pass through these stages to the grid of the third video i.f., V207. If the amplitude of the strong signal is great enough, the grid of V207 will be driven positive causing it to draw current. This current will flow through resistors R223, R319 and R251. The voltage developed, by this current, across R319 and R251, appears on the a-g-c line and is applied to the grids of the r-f amplifier (V101), and the 1st and 2nd sound i-f amplifiers (V201 and V202). Since this voltage is negative, it increases the bias on these stages and reduces the gain of the receiver. To eliminate this effect, the grid circuit of the third video i-f stage is disconnected from the a-g-c line when the Selector Switch is in the FM position. To accomplish this, a new Selector Switch is required.

Procedure:

1. Change S201
2. Disconnect R223 from junction of C226 and R319 and connect this end to S201-12, as shown in figure P3.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
S201	05004661	Switch Service Selector

The first chassis to incorporate this change are listed below:
 RA-112A — No. 1239006
 RA-113 — No. 1343368
 All chassis so modified are coded "A-A".

Change No. 41 (ECN-4750)

Reason:

To eliminate a pattern of fine diagonal lines, referred to as "snakes," which sometimes occurs on channel 8 in receivers equipped with a channel 5 trap. This interference is caused by the seventh harmonic (183.75 mc) of the video i.f. (26.25 mc) and the video carrier of channel 8 (181.25 mc) which combine to produce a 2.5 mc beat.

Procedure:

Add a 2.5 mmf capacitor between pin 7 of V209A, the video detector, and ground, in parallel with L219 and C227, the 78.75 mc trap.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C220	03015240	Cap F Ce 2.5 mmf 10% 500V

The first chassis to incorporate this change were:
 RA-112A — No. 1246882
 RA-113 — No. 1348066

Change No. 42 (ECN-4798)

Reason:

Same as RA-109A, Change No. 40.

Procedure:

1. Change R249
2. Change C236
3. Change Z209

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C236	03015790	Cap F Ce 20 mmf 10% 500V
	03020350	
R249	02031940	Res F C 27K 10% 1/2W
	02041940	
	02051940	
Z210	20006231	Trans narrow band sync

The first chassis to be so modified were:

RA-112A — No. 1252325
 RA-113 — No. 1351175

Change No. 43 (ECN-4809)

Same as RA-109A, Change No. 41 except symbols of two jacks are J206 and J207.

The first chassis to incorporate this change were:

RA-112A — No. 1252325
 RA-113 — No. 1351175
 All chassis so modified are coded "A-C".

Change No. 45 (ECN-4799)

Reason:

To eliminate interference on channel 10 which sometimes occurs when the ninth harmonic of the audio i-f carrier (21.75 x 9 = 195.75) is radiated and beats with the video carrier of channel 10 (193.25) (195.75 - 193.25) to produce a 2.5 mc beat.

Procedure:

1. Add C307 between V201-4 and ground, keeping the leads 1/2" long.
2. Add C308 between V203-9 and ground, keeping the leads 1/2" long.
3. Add C309 between V203-6 and ground, keeping the leads 1/2" long.
4. Add L207 between V203-6 and the junction of R265 and R318.
5. Remove the black wire to V203-7 and reconnect it to the ground tab near V204-4.
6. Remove the ground wire to V203-7. Bend pin V207-7 down and solder it to the side of the tube socket.
7. Remove the ground wire from V203-5. Bend pin V203-5 down and solder it to the side of the tube socket.
8. Solder tube socket V203 to the chassis.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C307	03015300	Cap F Ce 47 mmf 10% 500V
	03012730	
	03104460	
C308	Same as C307	
C309	Same as C307	
L207	21007241	Coil Choke

This change was first incorporated in chassis:

RA-112A — No. 1253897
 RA-113 — No. 1351039

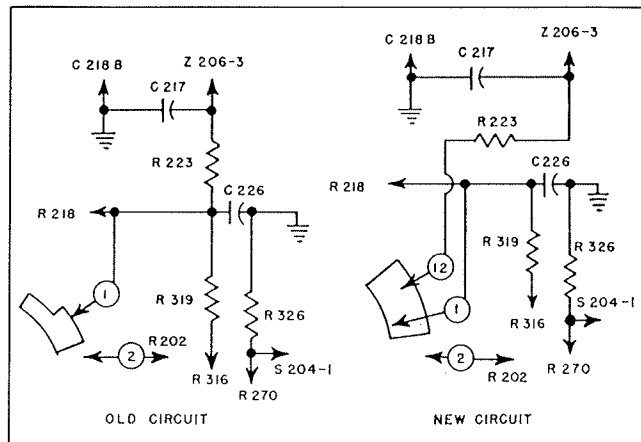


Figure P-3. Change No. 40, RA-112A - RA-113.

Production Changes (Cont'd)

RA-112A

Change No. 44 (ECN-4624)

Reason:

Sufficient 15KC sweep signal reaches the grid circuit of the vertical blocking oscillator to cause it to fire irregularly. The changes below offer a very low grid impedance to the 15KC signal thus alleviating this condition.

Procedure:

- Rewire the socket of V220 to reverse the two halves of the 6SN7.

V220-B	from	to	V220-A	from	to
	1	4		4	1
	2	5		5	2
	3	6		6	3
- Shield the wire connecting R292 to R293. Connect the shield to the -50V line and cover it with tape or spaghetti to prevent the possibility of shorting the -50V line to ground.
- Disconnect C271 (near T203) and reconnect it in series with the yellow lead of T203 and the junction of C267 and R291.
- Connect the free end of R293 to the junction of C271 and the yellow lead of T203.
- Connect the green lead of T203 to V220B-4.
- Add C258 between the green lead of T204 and ground.
- Disconnect the end of R294 connected to the line between V220B-5 and the junction of R296 and C268. Reconnect R294 directly to V220B-5.
- Shield the line from V220B-5 and the junction of R296 and C268, grounding the shield.
- Shield the red, yellow and green leads of T203, connecting the shields to ground.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C258	03014770 03100130	Cap F Pa .1 mf 20% 400V

The first chassis to incorporate this change was:
 RA-112A — No. 1243110
 The chassis so modified are coded "A-B".

RA-113

Change No. 46 (ECN-4675)

Reason:

To prevent the dial light from reflecting across the cathode-ray tube, a light shield is added.

Parts Required:

PART NUMBER	DESCRIPTION
42004142	Shield Light

RA-116A

Change No. 2 (ECN-4676)

Same as RA-109A, Change No. 38.

Change No. 3 (ECN-4683)

Same as RA-109A, Change No. 39
 This change has been incorporated in all RA-116A Chassis.

Change No. 4 (ECN-4798)

Same as RA-109A, Change No. 40
 The first chassis to be so modified was:
 RA-116A — No. 16276
 All chassis so modified are coded "M".

Change No. 5 (ECN-4809)

Same as RA-109A, Change No. 41
 The first chassis to incorporate this change was:
 RA-116A — No. 16276
 All chassis so modified are coded "M".

RA-117A

Change No. 4 (ECN-4700)

Reason:

To reduce stray coupling which results in one-sided eye deflection.

Procedure:

- Disconnect C201 from V201-2 and reconnect it to Z201-2.
- Disconnect C202 from V201-3 and reconnect it straight to ground.
- Disconnect C206 from V202-3 and reconnect it straight to ground.
- Disconnect R201 from V201-2 and reconnect it straight to ground.
- Disconnect R274 from V202-2 and reconnect it straight to ground.
- Disconnect C281 from V201-6 and reconnect it straight to ground.
- Dress all leads in the vicinity of the corner of the Selectuner chassis, near V204, as far away from the lead coming from the tuner to C301 as possible.

The first chassis to incorporate this change was:
 RA-117A — No. 17471

Change No. 5 (M-215)

Reason:

To decrease the possibility of vertical drift due to C271 changing value, C271 (near T203) is changed from a 400V to a 600V unit.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C271	03101540	Cap F Pa .01 mf 5% 600V

The first chassis incorporating this change was:
 RA-117A — No. 17633

Change No. 6 (ECN-4685)

Reason:

To eliminate a pattern of streaks which sometimes appears on channel 7. This pattern is caused by the eighth harmonic of the sound carrier (21.75 x 8 = 174) which is produced in the audio discriminator. It feeds into the video i-f strip through the a-g-c circuit (the a-g-c clamping and the discriminator diodes are located in the same tube) and beats with the video carrier to produce the above effect.

Procedure:

- Add C208 from V203-4 to ground.
- Add L207 in series with V203-6 and the junction of R265 and R318, near V212.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C208	03015610	Cap F Ce 5000 mmf min
L207	21007241	Coil Choke, grey-yellow

The first chassis incorporating this change was:
 RA-117A — No. 173081

Change No. 7 (ECN-4731)

Reason:

To reduce difficulties with neck cut-off.

Procedure:

Reverse the focus-coil leads.
 The first chassis incorporating this change was:
 RA-117A — No. 172985

Change No. 8 (ECN-4735)

Reason:

To improve the overall bandpass of the i-f strip by reducing the "valley" between the two peaks.

Procedure:

Change R332 near V205 from 5.6K to 2.7K.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R332	02030580	Res F C 2.7K 5% 1/2W

The first chassis incorporating this change was:
RA-117A — No.173000

Change No. 9 (ECN-4750)

Same as RA-112A — RA-113, Change No. 41.

The first chassis incorporating this change was:
RA-117A — No. 177990

Change No. 10 (ECN-4799)

Same as RA-112A, Change No. 43

The first chassis to incorporate this change was:

RA-117A — No. 1712365

All chassis so modified are coded "F".

Change No. 11 (ECN-4624)

This change has already been incorporated in the first edition of the RA-117A Schematic Sheet. Same as RA-112A, Change No. 45.

The first chassis to incorporate this change was:

RA-117A — No. 176676

All chassis so modified are coded "D".

Change No. 12 (ECN-4686)

Reason:

To provide a video output jack to provide for future use of a color converter.

Procedure:

1. Add J205
2. Connect C225 between the center conductor of J205 and the junction of R237, R239A and C276.
3. Ground the outer terminal of J205.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C225	03014770	Cap F Pa .1 mf 20% 400V
	03100130	
J205	09002760	Connector female 1 contact

The first chassis to be so modified was:

RA-117A — No. 173419

All chassis so modified are coded "C".

Change No. 13 (ECN-4809)

Same as RA-109A, Change No. 41 except symbols of two jacks are J206 and J207.

The first chassis to incorporate this change was:

RA-117A — No. 1710886

All chassis so modified are coded "E".

Change No. 14 (ECN-4798)

Same as RA-112A — RA-113, Change No. 42.

The first chassis to be so modified was:

RA-117A — No. 1710886

All chassis so modified are coded "E".

Changers and Cartridges Used In Du Mont Telesets

DU MONT TELESSET	CHANGER		CARTRIDGE	
	MANUFACTURER & MODEL	DU MONT PART NO.	MANUFACTURER & MODEL	DU MONT PART NO.
Sherwood, Plymouth, Westminster I, Savoy, Revere, Devonshire	Webster-Chicago Model 100	69-1, 69-2, 19034351	Astatic Nylon (199) 1J	19034360
Savoy, Colony	Webster-Chicago Model 256	19034401	Webster-Chicago V42-2	19034450
Bradford (early)	Crescent 6- Series, 45 RPM	19034491	Sonotone W-7530	19034510
Bradford (late)	Webster-Chicago Model 77	19034521	Sonotone W-7530X	19034530
Wellington	V-M Corp Type 407	19034541	Astatic LQD-1J	19034560
Sherbrooke	Webster-Chicago Model 100	19034581	Webster Electric A7-8	19034630
Sherbrooke	Webster-Chicago Model 100	19034582	Sonotone W-7580 or RW-13007	19034640
Westminster II	Webster-Chicago Model 100	19034611	Sonotone W-7580 or RW-13007	19034640
Tarrytown	V-M Corp 560	19034591 19034592 19034593	Webster Electric A-1-8	19034670

PARTS LIST CHANGES

RA-109A — RA-116A

Main Chassis Parts List

Add:
 J216 09019870 Connector Female 1 contact
 J217 09019870 Connector Female 1 contact

RF Tuner Assembly Parts List

Delete:
 V102 89003011 Inputuner Assy
 25000180 Tube Elec 6AK5

Add:
 V102 89003013 Inputuner Assy
 25002020 Tube Elec 6BC5

RA-112A

Miscellaneous Parts List

Delete:
 41001951 Sleeve Insulating

RA-113

Miscellaneous Parts List

Delete:
 34002378 Socket Assy CRT

Add:
 34002379 Socket Assy CRT
 42004142 Shield Light

RA-112A — RA-113

Main Chassis Parts List

Delete:
 C228
 C298
 C299
 S201
 Z203
 Z205
 Z206
 Z207
 Z208

64003221 Dial Bezel

Add:
 C220 03015240 Cap F Ce 2.5 mmf 10% 500V
 C228 03021840 Cap F M 47 mmf 10% 500V
 03012730
 03015300
 C236 03015790 Cap F Ce 20 mmf 10% 500V
 C258 03014770 Cap F Pa .1 mf 20% 400V
 03100130
 C298 03020080 Cap F M 47 mmf 10% 500V
 03015300
 03012730
 C301 03055680 Cap F Ce 100 mmf 10% 500V
 C307 03015300 Cap F Ce 47 mmf 10% 500V
 C308 03015300 Cap F Ce 47 mmf 10% 500V
 C309 03015300 Cap F Ce 47 mmf 10% 500V
 J206 09019870 Connector Female 1 contact
 J207 09019870 Connector Female 1 contact
 R249 02031940 Res F C 27K 10% 1/2W
 S201 05004661 Switch Service Selector
 Z203 20005271 Trans Sound Discriminator
 20005831
 Z205 20005781 Trans Video IF
 20004741

Z206 20005801 Trans Video IF
 20005711
 Z207 20005791 Trans Video IF
 20004751
 Z208 20005821 Trans Video IF
 20005241
 Z209 20006231 Transformer Narrow Band Sync
 45002491 Window, Dial
 64004061 Dial Bezel

RF Tuner Assembly Parts List

V102 25002020 Tube Elec 6BC5
 25002760

RA-116A

Miscellaneous Parts List

Delete:
 R401

Add:
 R401 02037840 Res F C 3.9K 10% 2W

RA-117A

Main Chassis Parts List

Delete:
 C228
 C271
 C298
 C299
 R213A-B
 R239A-B
 R332
 Z203
 Z205
 Z207
 Z208

Add:
 C208 03015610 Cap F Pa 5000 mmf min
 C228 03021840 Cap F M 47 mmf 10% 500V
 03012730
 03015300
 C258 03014770 Cap F Pa .1 mf 20% 400V
 03100130
 C271 03101540 Cap F Pa .01 mf 5% 600V
 C298 03020080 Cap F M 47 mmf 10% 500V
 03015300
 03012730
 J206 09019870 Connector Female 1 contact
 J207 09019870 Connector Female 1 contact
 L207 21007241 Coil, Choke, grey-yellow
 R213A-B 01028210 Res Var C 50K-1 meg SPST 1/4W
 R239A-B 03101340 Res Var C 1K - 100K 1/4W
 03103590
 R332 02030580 Res F C 2.7K 5% 1/2W
 Z203 20005271 Trans Sound Discriminator
 20005831
 Z205 20005781 Trans Video IF
 20004741
 Z206 20005801 Trans Video IF
 20004711
 Z207 20005791 Trans Video IF
 20004751
 Z208 20005821 Trans Video IF
 20005241

Errata

January Service News

- Page 4, RA-109A, Change No. 35, Procedure, Step 5, second line should read: "and reconnect it to the junction of C255 and the yellow lead of T201."
- Page 6, "Substituting the 17BP4A CRT," line 3 should read: "coating. Since the 17BP4A is slightly longer"
- Page 8, "Video Peaking Coil Characteristics." Heading "Inductance in Millihenries" should be: "Inductance in Microhenries."

More on Horizontal Pull

Articles discussing horizontal pull appeared in the January and February issues of the SERVICE NEWS. Since the appearance of those articles, reports from the field have indicated a need for further discussion of the problem.

The proper procedure to use in attacking a receiver which is exhibiting horizontal pull is as follows:

1. Analyze the picture carefully to make certain that the difficulty is actually horizontal pull and not "jitter," "S distortion" or loss of sync.
2. Check the setting of the a-g-c control. The control should be set using the strongest signal received as a reference. Turn the control in one direction until pulling occurs; then turn it in the opposite direction until pulling again occurs. Set the control midway between these two points. If it is not possible to secure satisfactory results by resetting the a-g-c control, proceed with step 3.
3. Realign the narrow-band sync transformer. One procedure for accomplishing this was given in the February issue. A second, and simpler procedure, which will prove

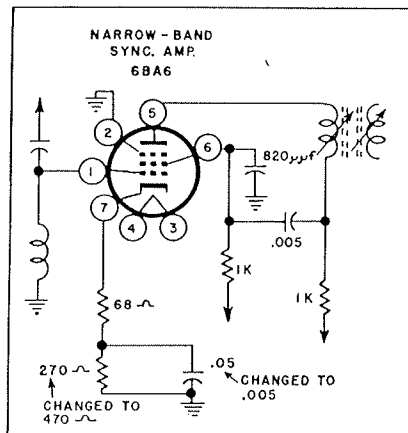


Figure M-1.

Channel 5 and 8 Interference

In areas where channels 5 and 8 are received, a number of cases of beat interference have occurred. Suitable traps have been included in current production RA-109A, RA-112A, RA-113 and RA-117A Telesets to eliminate this difficulty. When 300-ohm parallel-wire transmission line is used in an installation, it may be difficult to completely eliminate such interference.

If this condition is encountered in an installation using 300-ohm transmission line, the line should be replaced with 72-ohm coax, or a six-foot length of coax line should be connected between the input of the Teleset and the receiver end of the 300-ohm line. The six-foot length of coax should be brought straight away from the Teleset and the 300-ohm line re-run, if necessary, to keep it as far as possible from the receiver.

If interference is still present the following procedure should be used to eliminate it:

1. Connect a Channel 5 trap between the plate of the first video amplifier
- satisfactory in most cases, is given at the end of this article.
4. After realigning the narrow-band sync transformer reset the a-g-c control as described in step 2.
 5. If the pulling persists proceed to make the circuit changes described below.
 - a. Remove the bypassed 270 ohm resistor in the cathode circuit of the narrow-band sync amplifier, and replace it with a 470 ohm unit, as shown in figure M-1. The symbol number of this resistor is R359 in the RA-109A, and R315 in the RA-112A, RA-113, and RA-117A Telesets. This change has already been made in Telesets with serial numbers higher than those listed below:
 RA-109A—No. 0944418
 RA-112A—No. 1237485

and ground. This trap should consist of a 5 mmf capacitor (Part No. 03 055 500) and a variable inductor (Part No. 21 007 131) connected in series.

2. In late RA-112A, RA-113, RA-117A and RA-120 chassis a fixed channel 5 trap (L220) is connected to the cathode of the cathode-ray tube. Remove this trap.
3. Connect a 100 mmf ceramic capacitor, with 3/4 inch leads, from the high side of the video-detector filament to ground.
4. Connect a 5 mmf capacitor (Part No. 03 055 500) from the plate of the video detector to ground. In some receivers a 2.5 mmf capacitor is already connected at this point. The 2.5 mmf capacitor should be removed.
5. The Channel 5 trap connected between the plate of the video detector and ground should not be disturbed.
6. Adjust all traps until the interference is no longer observed.

RA-113 —No. 1342059
 RA-117A—No. 173709

- b. Remove the ends of the 18K resistor and the 0.1 mfd capacitor from pin 5 of the sync detector socket. The symbol numbers of these components are R275 and C249 in the RA-109A; and R249 and C261 in the RA-112A, RA-113, RA-117A and RA-120. Connect a parallel network, consisting of a 0.1 mfd capacitor and a 1 meg resistor, between pin 5 of the socket and the ends of the 18K resistor and 0.1 mfd capacitor, as shown in figure M-2.
- c. If jacks have been mounted on the chassis and wired to the ends of R284, they should be rewired, one to each end of the RC network as shown in figure M-2. If the jacks are not present, it

is not necessary to add them.

If the Teleset is installed in a location where signals are weak and there is considerable noise, the jacks across the RC network may be shorted to improve the noise immunity of the Teleset. In such a location horizontal pull will not be encountered.

Before shorting the jacks make certain that they are connected across the RC network and not R284. Shorting the jacks when they are connected across R284 will reduce, rather than increase, the noise immunity of the Teleset. The jacks are connected across R284 in chassis with the serial numbers given below:

- RA-109A—
Nos. 0952654 to 0955498
- RA-112A—
Nos. 1252325 to 1257157
- RA-113—
Nos. 1351175 to 1352001
- RA-116—
Nos. 16276 and over

d. Remove the .05 mfd bypass capacitor in the cathode circuit of the narrow-band sync amplifier and replace it with a .005 mfd capacitor, as shown in figure M-1. The symbol number of this capacitor is C312 in the RA-109A; and C287 in the RA-112A, RA-113, RA-117A and RA-120.

7. Realign the narrow-band sync transformer using the procedure described in the February issue of the SERVICE NEWS, or the procedure described below. In some cases the procedure given here will not give as satisfactory results as the one described in the February issue, consequently the latter procedure should be used when possible.

Realigning the Narrow-Band Sync Transformer

1. Turn the Teleset on and tune it to the sound-null-point on a strong signal.
2. Turn up the brightness control until retrace lines are visible.
3. Adjust the top and bottom slugs of the narrow-band sync transformer for brightest retrace lines and minimum video.
4. Reset the brightness control for a normal picture and adjust the a-g-c control for good contrast ratio, on the strongest station in the area.

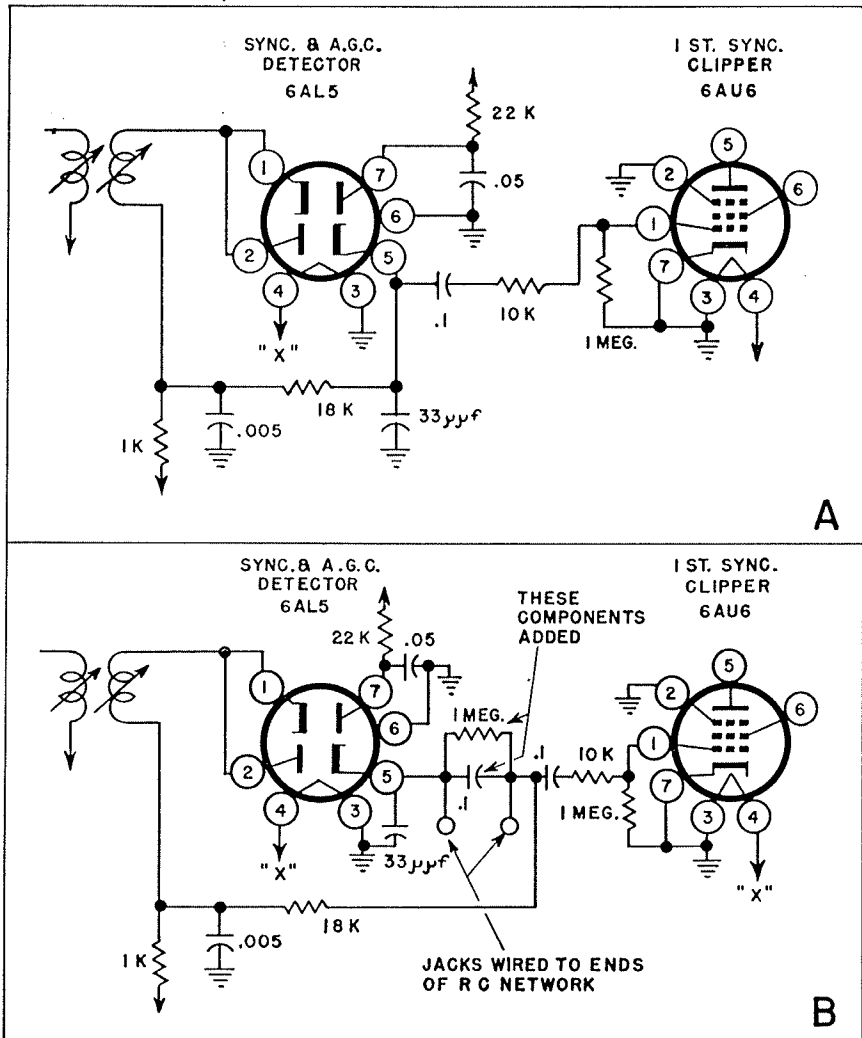


Figure M-2. A: before changes; B: after changes.

5. Check the horizontal-hold control. If the setting for proper hold is critical, a slight readjustment of the top slug of the narrow-band sync transformer, to center it in its range of minimum video, should increase the horizontal hold-control range, over which horizontal synchronization is maintained.

NOTE
In step 2 of the procedure for realigning the narrow-band sync transformer, which appeared in the February issue, the oscillograph should be connected to the plate of V218 in the RA-109; and the plate of V219 in the RA-112A, RA-113 and RA-117A.

Replacing 5U4Gs

When 5U4G rectifiers are mounted horizontally they should be oriented so that the long sides of the plates are vertical, as shown in Figure S-1. Mounting the tube in this way eliminates the possibility of filament-to-plate shorts and consequent transformer damage due to filament sag. Since all manufacturers do not orient the pins and the plates in the same way, the positions of the plates should be checked when making replacements.

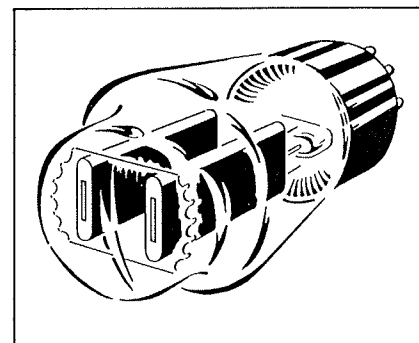


Figure S-1.

PRODUCTION CHANGES

RA-109A

Change No. 42 (ECN-4877)

Reason:

To eliminate "pull," or horizontal displacement of the picture, caused by over modulation of the transmitted signal. Under this condition, video enters the sync circuits and disturbs the operation of the horizontal oscillator.

A 1 meg resistor in parallel with a 0.1 mf capacitor are added in the output circuit of the sync detector. This RC combination places a positive bias, proportional to the strength of the received signal, on the cathode of the sync detector. The bias causes clipping of the composite-video signal in the sync detector, and a portion of the video and pedestal signal does not appear in its output. This results in an increase in the sync-to-video ratio of the signal applied to the sync clipper (V218).

Since the sync clipper is now working with an input signal containing a greater percentage of sync, it removes all of the video and pedestal components of the composite television signal and passes on a clean, clipped sync signal to the succeeding stages. This change impairs the vertical stability slightly on weak signals. (Horizontal "pull" is confined to strong signals.) The two jacks, added by Change #41, are rewired so that they may be used to short out the RC combination, if the Teleset is to operate in a weak signal area. Shorting the RC network increases the vertical noise immunity. C312, the cathode bypass of V216, the narrow band sync amplifier, is changed from .05 mf to .005 mf to equalize the gain of the narrow-band sync amplifier on horizontal and vertical sync signals. The .05 mf capacitor by-passed R359 at the horizontal frequency but permitted considerable degeneration and consequent loss of gain at the vertical frequency.

Procedure:

1. Add R234 between V217-5 and the junction of R275 and C249, C306 remaining on V217-5.
2. Add C260 in parallel with R234.
3. Change value of C312 to .005 mf.
4. Rewire J216 and J217, one to each of C260 and R234.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C260	03 014 780	Cap F Pa .1 mf 20% 200V
C312	03 015 610	Cap F Ce 5000 mmf min.
R234	02 032 600	Res F C 1 meg 20% 1/2W

The first chassis to be so modified is:

RA-109A — No. 0955498 and is coded "O".

RA-112A — RA-113

Change No. 47 (ECN-4833)

Reason:

To eliminate the possibility of breakdown of R262 due to overheating, its wattage rating is increased.

Procedure:

Remove R262 and replace it with a 1 watt unit.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R262	02 035 540	Res F C 100K 20% 1W
	02 045 540	
	02 055 540	

The first chassis to be so modified is:

RA-112A — No. 1257901

RA-113 — No. 1352980

Change No. 48 (ECN-4836)

Reason:

Same as RA-109A, Change No. 42, except for symbol numbers shown below:

Sync detector — V213
Narrow band sync amp. — V212
1st sync clipper — V219

RC combination — R340 and C310
V212 cathode bypass — C287

Procedure:

1. Remove the junction of R249 and C261 from V213-5.
2. Add R340 between V213-5 and the junction of C261 and R249, C236 remaining on V213-5.
3. Add C310 in parallel with R340.
4. Change value of C287 to .005 mf.
5. Rewire J216 and J217, one to each end of C310 and R340.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C310	03 014 780	Cap F Pa .1 mf 20% 200V
C287	03 015 610	Cap F Ce 5000 mmf min.
R340	02 032 600	Res F C 1 meg 20% 1/2W

The first chassis to be so modified are:

RA-112A — No. 1257059 Coded "A-G"

RA-113 — No. 1352001 Coded "A-G"

Change No. 49 (ECN-4834)

Reason:

To reduce cross-talk in the FM position. If a strong f-m station is close enough, in frequency, to the station to which the Teleset is tuned, it will fall within the pass band of the rf and video if stages. As a result sufficient signal to cause cross-talk, will reach the sound i-f stages. The wiring of S201 is changed to eliminate this condition.

Procedure:

1. Delete connection between S201-1 and the junction of R218-C226.
2. Delete connection between S201-2 and the junction of R202-C205.
3. Delete connection between S201-12 and R223.
4. Connect R223 to the junction of C226, R319 and R218.

The first chassis to be so modified are:

RA-112A — No. 1257907

RA-113 — No. 1353316

RA-117

Change No. 15 (ECN-4824)

Reason:

To comply with U.L. requirements, leads have been redressed.

The first chassis to be so modified is:

RA-117A — No. 1713254 Coded "G"

Change No. 16 (ECN-4836)

Reason:

Same as RA-109A, Change No. 42, except for symbol numbers shown below:

Sync detector — V213
Narrow band sync amp — V212
1st sync clipper — V219
R-C combination — R340 and C310
V212 cathode bypass — C287

Procedure:

1. Remove the junction of C261 and R249 from V213-5.
2. Add R340 between V213-5 and the junction of C261 and R249, C236 remaining on V213-5.
3. Add C310 in parallel with R340.
4. Change value of C287 to .005 mf.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C310	03 014 780	Cap F Pa .1 mf 20% 200V
C287	03 015 610	Cap F Ce 5000 mmf min.
R340	02 032 600	Res F C 1 meg 20% 1/2W

The first chassis to be so modified is:

RA-117A — No. 1714441 Coded "H"

Change No. 17 (ECN-4833)

Same as Change No. 47, RA-112A — RA-113.

The first chassis to be so modified is:

RA-117A — No. 1715760

PARTS LIST CHANGES

RA-109A — RA-116A Main Chassis

Delete:

SYMBOL	PART NUMBER	DESCRIPTION
C312	03 000 950	Cap F Pa .05 mf 20% 200V
	03 100 030	
L215	21 005 901	Coil Coupling

Add:

C260	03 014 780	Cap F Pa .1 mf 20% 200V
C312	03 015 610	Cap F Ce 5000 mmf min
L215	21 006 781	Coil Coupling

Delete Alternates:

R260	02 041 670
------	------------

Add Alternates:

R283	02 118 910
------	------------

RA-112A — RA-113 Main Chassis

Delete:

C287	03 000 950	Cap F Pa .05 mf 20% 200V
	03 100 030	
R262	02 032 540	Res F C 100K 20% 1/2W
	02 042 540	
	02 052 540	

Add:

C287	03 015 610	Cap F Ce 5000 mmf min
C310	03 014 780	Cap F Pa .1 mf 20% 200V
R262	02 035 540	Res F C 100K 20% 1W

	02 045 540	
	02 055 540	
R340	02 032 600	Res F C 1 meg 20% 1/2W
Add Alternates:		
C269	03 103 590	

Tarrytown Miscellaneous Parts List

Delete:

19 034 593	Reproducer sound
------------	------------------

Add:

19 034 661	Reproducer sound
------------	------------------

RA-117A Main Chassis

Delete:

C287	03 000 090	Cap F Pa .05 mf 20% 200V
R262	02 032 540	Res F C 100K 20% 1/2W
	02 042 540	
	02 052 540	

Add:

C287	03 014 780	Cap F Pa .1 mf 20% 200V
C310	03 014 780	Cap F Pa .1 mf 20% 200V
R262	02 035 540	Res F C 100K 20% 1W
	02 045 540	
	02 055 540	
R340	02 032 600	Res F C 1 meg 20% 1/2W
Add Alternates:		
C269	03 103 590	

Tube Substitution Table

Due to the current tube shortage it has been necessary to make some tube substitutions in Du Mont Telesets. Before making each substitution exhaustive tests have been made to assure that the substitution will perform as good or better than the original. The accompanying table will be valuable as a reference for substitute replacements during tube shortages in the field.

The column headed "Code" gives the number stamped on the rear of the Teleset chassis to indicate that the substitution has been made in production.

The column headed "Reference" gives the page in the Service Notes on which the substitution is discussed. Thus "G14E" refers to page 14E in the General Section of the Service Notes.

Several tube changes have been made which are not listed here. These are part of circuit design modifications, and are covered in Production Changes.

Tube Type	Use	Substitute	Code	Reference
RA-109A — RA-116A — RA-119A				
6AU6	*V205, 206 1st & 2nd video i.f.	6BA6	4	G-14E, F
6BC5	*V211, 4th Video IF	6CB6	9	
RA-112A — RA-113				
6AU6	*V205, 206 1st & 2nd video i.f.	6BA6	2, 3, 4	G-14E, F
6AU6	V219 1st sync clipper	6BC5	2, 3, 5, 6, 7	G-14E, F
6AU6	†V202 2nd sound i.f.	6CB6		
6AH6	‡V210 video amp.	6CB6	1, 2	G-14E, F
6AH6	V210 video amp.	6AC7	6, 7	G-14F
6BC5	*V208 4th video i.f.	6CB6	9	
6T8	V203 discriminator & 1st sound amp.	6AT6 & 6AL5	8	
RA-117A				
6BC5	*V208 4th video i.f.	6CB6	9	
RA-120				
6BC5	*V208 4th video i.f.	6CB6	9	

* V205 and V206 must be changed at the same time.

† The 6CB6 must be shielded.

° Pin 7 and 2 must be tied together.

‡ Pin 7 and 2 must be interchanged.

SERVICE NOTES

Inputuners with part numbers stamped on them may sometimes be encountered. These part numbers should not be used when ordering a replacement. The part number specified in the Replacement Parts List should always be used.

In the future all yokes supplied as replacements for use in RA-108A, RA-109A, RA-110A, RA-112A, RA-113, RA-116A and RA-117A Telesets will not be equipped with leads.

Consequently, leads from defective yokes, should not be discarded, or returned with the yoke, as in the past, but should be retained for use when installing replacements.

The Inputuner dial cord, pulleys, and gear mechanism in the RA-103D, RA-104A and RA-110A Models can be made accessible for adjustment without removing the chassis from the cabinet. To accomplish this, remove the tuner knobs, the escutcheon, and the dial plate from the front. In this way, cam gear, dial cord, and other replacements may be made quickly.



DIRECTORS CORNER

BY
Harold J. Schulman
 DIRECTOR OF SERVICE

Have you ever sat around a conference table arguing the pros and cons of somebody's brainchild — when each speaker gave such good reasons for doing it his way that it seemed impossible to reach a decision?

Finally the one silent member of the group remarks: "Why don't we ask the people concerned?"

That's exactly what we would like to do!

We know from experience that Du Mont Telesets are easy to service when you have the right information available. Our "know-how" is passed on to you through Du Mont service manuals, service notes, the factory school and the SERVICE NEWS

We would like to give you, the user of this information, an opportunity to express your ideas on how it can be made more useful to you.

We are proud to have on our staff, heading Teleset Service Publications, a co-author of the well-known "Video Handbook," Mr. Joseph J. Roche. Mr. Roche is at present preparing the format for future Service Manuals, under the direction of Mr. Carl Quirk, head of our Teleset Service Technical Section and a writer of many magazine articles.

We would like to know which features of our present service manuals you like, and which ones you feel can be improved.

Several questions are listed on an addressed postcard mailed to you with this issue of the SERVICE NEWS. If you can find the time to fill out the card, we will appreciate it.

Our aim is to develop manuals, bulletins and notes which will help you service Du Mont Telesets, faster, easier, and more profitably. Why not fill out the card now while you think of it?

INCREASING TELESET GAIN

In weak signal locations it is sometimes impossible to obtain a satisfactory picture with even the most elaborate antenna installation. The modification described here will increase the gain of RA-112A, RA-113, and RA-117 Telesets sufficiently to make it possible to obtain an acceptable picture in many such cases. The additional gain is obtained by increasing the plate load resistance of the video amplifier, as shown in Figure G-1. The increased plate resistance reduces the bandwidth of the stage necessitating additional high-frequency peaking. While the additional peaking partially compensates for the loss in bandwidth, some reduction occurs as a result of

the increase in the video amplifier plate-load resistor.

Since noise is always the factor which limits resolution when receiving weak signals, the loss of potential resolution resulting from the reduction in bandwidth has no effect.

When the receiver is tuned to a strong signal, the narrower bandwidth will reduce the resolution of the picture. To overcome this difficulty the Local-Distant switch is rewired so that the additional components are inserted when the switch is placed in the "Distant" position, and are removed when the switch is placed in the "Local" position.

The switch should only be in the

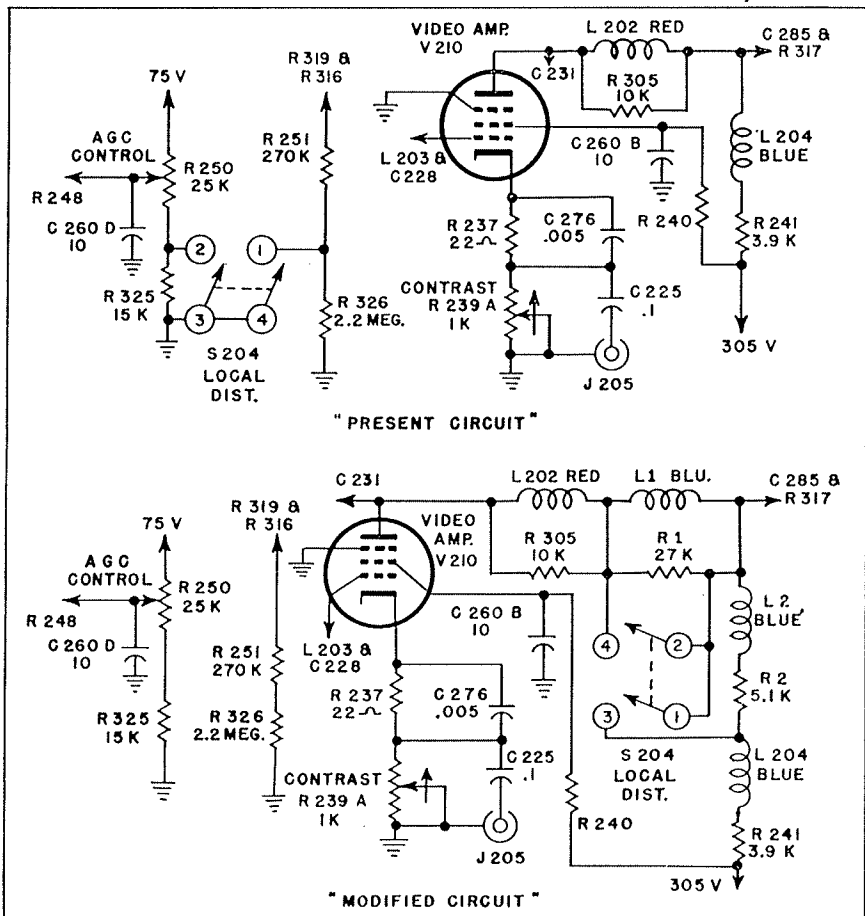


Figure G-1

"Distant" position when a very weak signal is being received.

The procedure for making the modification is as follows:

1. Remove the black lead running from ground to S201-3 and -4. Remove the connection between S204-3 and -4 (the Local-Distant switch).
2. Remove the orange lead running between R250 (the a-g-c control) and S204-2.
3. Remove the purple lead running from S204-1 to the junction of R326 and R251 (near V220).
4. Disconnect L202 and R305 from junction of C285, R317 and L204.
5. Connect the free ends of L202 and R305 together, and connect this junction to S204-4, as shown in Figure G-2.
6. Connect R1 and L1 in parallel between S204-2 and S204-4.

7. Disconnect L204 from the junction of C285 and R317.
8. Disconnect the junction of L204 and R241 from the terminal strip.
9. Connect L204 between the free end of R241 and S204-3.
10. Mount a one position terminal strip in the corner of the chassis nearest the Local-Distant switch. The sheet metal screw in the chassis at this point may be removed and the terminal strip mounted with a machine screw, nut, and lockwasher.
11. Run a lead from the junction of C285 and R317 to S204-1 and place a jumper between S204-1 and S204-2.
12. Connect R2 (5.1K) from S204-3 to the terminal strip added in step 10.
13. Connect L2 from the terminal strip added in step 10 to S204-1.

14. Dress all components and leads for minimum capacity effect. Dress all components so that they do not protrude below the bottom of the Teleset chassis.

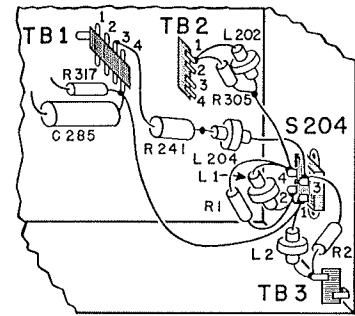


Figure G-2

Parts Required

SYMBOL	PART NO.	DESCRIPTION
L1	21 006 627	Video peaking coil, blue
L2	21 006 627	Video peaking coil, blue
R1	02 031 940	Res F C 27K 10% 1/2W
R2	Not Stocked	Res F C 5.1K 5% 2W

CRYSTAL PROBE

A crystal probe is required to properly align Du Mont Telesets. The alignment procedure calls for the use of a probe in aligning some stages, while for others the oscillograph is connected directly to the circuit. One of the features of the probe described below is the incorporation of a switch to eliminate the necessity of changing leads between alignment steps.

If miniature components are used in the construction of the probe, it may be mounted in a case made from one of the plastic mounting clamps used to mount 19 inch CRTs. The finned shank of the clamp should be removed and the clamp reworked as shown in Figure C-1b.

All leads should be covered with spaghetti and the entire 1N34 should be insulated to prevent shorts. Figure C-1c shows the wiring details, exploded slightly for sake of clarity.

A cover for the box can be made from a piece of plastic or metal. The switch should be mounted on this cover. The box may be drilled and tapped to provide a means of attaching the cover.

It is recommended that stranded hook-up wire be used for the signal-input lead. The ground lead should be made from braid and insulated. Both leads should be kept as short as practical. Coaxial cable should be used for the lead to the oscillograph. The switch positions should be clearly marked.

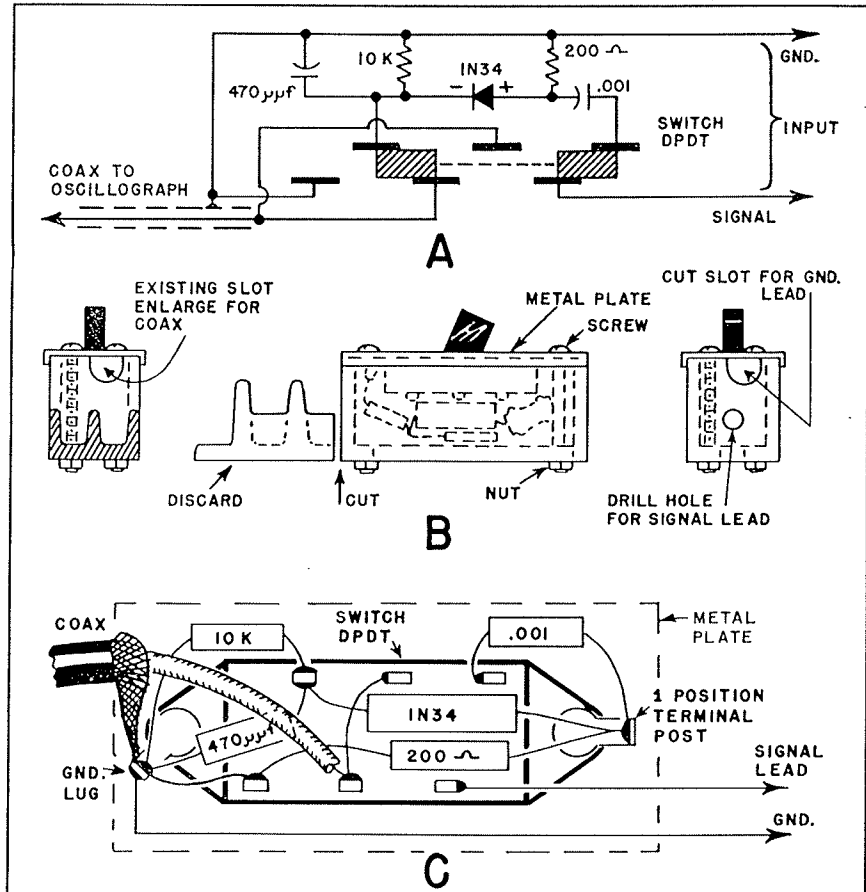


Figure C-1
Parts Required

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
Not Stocked	Switch, Slide DPT	02 050 310	Resistor, 200 ohms 5% 1/2W
03 013 810	Cap F Ce .001 mf 350V	02 031 890	Resistor, 10K 10% 1/4W
03 014 420	Cap F Ce 470 mmf 350V	37 002 241	Clamp, Mounting, 19" CRT
251N34	Crystal, 1N34		

PRODUCTION CHANGES

RA-112A — RA-113

Change No. 50 (ECN-4839)

Reason:

To comply with U/L requirements.

Procedure:

Add a clamp to hold the CRT cable between V218 and T203.

Parts Required:

PART NUMBER	DESCRIPTION
37 001 510	Clamp Cable 3/16

The first chassis to be so modified are:

RA-112A — 1256608
RA-113 — 1352001

All chassis so modified are coded "A-F".

Change No. 51 (ECN-4861)

Reason:

To reduce lead breakage in shipment.

Procedure:

Lace C268 and C269 together.

The first chassis to be so modified are:

RA-112A — 1259417
RA-113 — 1353900

RA-117A

Change No. 18 (ECN-4861)

Reason:

Same as RA-112A — RA-113 Change No. 51.

The first chassis to be so modified is:

RA-117A — 1717404

RA-120

Change No. 1 (ECN-4861)

Reason:

Same as RA-112A — RA-113 Change No. 51.

The first chassis to be so modified is:

RA-120 — 201945

PARTS LIST CHANGES

RA-109A — RA-116A

Delete:

SYMBOL	PART NUMBER	DESCRIPTION
	64 001 292	Mask CRT 19

Add:

	64 004 291	Mask CRT 19
--	------------	-------------

Delete Alternates:

C261	03 018 570	Cap F Pa .02 mf 20% 600V
C262	03 018 570	Cap F Pa .02 mf 20% 600V

RA-112A — RA-113

RA-117A — RA-120

Delete:

C280	03 016 896	Capacitor Coupling
C304	03 018 570	Cap F Pa .02 mf 20% 600V
	03 100 230	

C305	03 018 570	Cap F Pa .02 mf 20% 600V
	03 100 230	

Add:

C280	03 016 898	Capacitor Coupling
C304	03 018 570	Cap F Pa .02 mf 20% 600V
	03 018 560	

C305	03 018 570	Cap F Pa .02 mf 20% 600V
	03 018 560	

Add Alternates:

C220	03 015 240	Cap F Ce 2.5 mmf 10% 500V
	03 014 280	
C402	03 017 450	Cap F Pa 470 mmf 20% 10KV
	03 019 300	
C403	03 017 450	Cap F Pa 470 mmf 20% 10KV
	03 019 300	
C404	03 017 450	Cap F Pa 470 mmf 20% 10KV
	03 019 300	
R307	02 037 770	Res F C 1K 10% 2W
	02 047 770	
	02 057 770	

RA-112A

Delete:

64 001 292	Mask CRT 19
------------	-------------

Add:

64 004 291	Mask CRT 19
------------	-------------

RA-113

Delete:

18 002 791	Loudspeaker Assembly
------------	----------------------

Add:

18 002 794	Loudspeaker Assembly
------------	----------------------

Channel 10 Beat Interference

Beat frequency interference on Channel 10 is sometimes encountered in RA-109A Telesets. It usually occurs when 300 ohm unshielded transmission line is used, although it may be encountered with installations employing 72 ohm coaxial transmission line.

The interference can be eliminated by using the following procedure.

1. Disconnect the black-yellow lead running from the Inputuner to pin 9 of V206 (1st sound amp.), and connect it to pin 4 of V208 (1st video i.f.).

2. Connect a 47 mmf ceramic capacitor from pin 5 of V204 (sound discriminator) to ground.
3. Connect a 47 mmf ceramic capacitor from the junction of C209 and C210 to ground.
4. Connect a 47 mmf ceramic capacitor from pin 3 of V206 (2nd sound amp.) to ground.
5. Change ground on pins 4 and 5 of V206 as shown in Figure R-1.

The part number of the 47 mmf capacitors used in steps 2, 3 and 4 is 03 015 300.

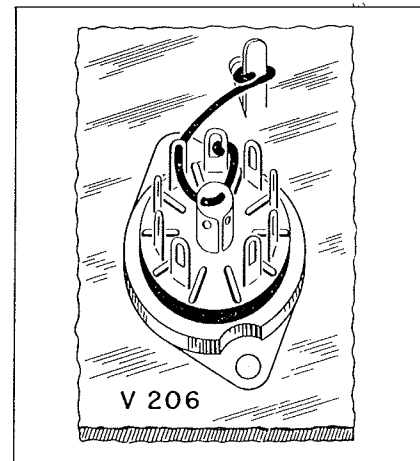


Figure R-1

Ordering Replacement Yokes

The chart below has been compiled to simplify the ordering of yokes for Du Mont Telesets. Part numbers are given for all yokes used with Du Mont chassis.

Part No.	Where Used
87 000 021	Early RA-109A through chassis No. 0927798
87 000 031	RA-112A, RA-109A, beginning with chassis No. 0927799; and RA-116A
87 000 041	RA-113 and RA-117A
87 000 051	RA-108A
87 000 061	RA-111A
87 000 201	RA-110A
21 003 540	RA101
21 003 610	RA102
21 004 242	RA-103C, RA-103D
21 004 241	RA-104A, RA-105A, RA-105B, RA-106A

New Matching Transformer

An impedance matching transformer designed to properly match 300 ohm transmission line to Du Mont Telesets is now available. The transformer, shown in Figure M-1, is a compact unit measuring 1" x 1 7/8" x 7/8". It mounts directly on the antenna input jack of the Teleset and is held in place by means of a clamp and screw.

The transformer is installed by inserting its output plug into the antenna jack of the Teleset, tightening the clamp with a screw-driver and connecting the 300 ohm transmission line to the terminals provided.

The part number of the new transformer is 20 006 091. The unit is available from your Du Mont Distributor.

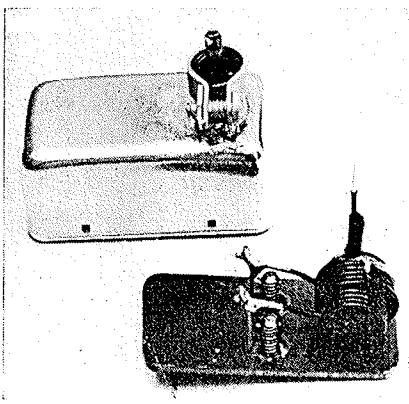


Figure M-1

ION-TRAP MAGNETS

The chart below lists information which the technician will find useful when identifying, replacing, or substituting ion-trap magnets (sometimes referred to as beam benders) in Du Mont Telesets.

In general, the magnetic force necessary for proper bending of the beam is a function of the accelerating voltage used on the tube. Thus, an ion-trap magnet suitable for use with a particular tube, when operated with an accelerating voltage of 8KV, will not be suitable for use with the same tube operating with an accelerating voltage of 15KV.

Recently, the electron guns used in Du Mont Teletrons were redesigned in order to secure improved picture focus. Tubes equipped with the redesigned gun may be identified by the X, Y, or Z placed at the ends of their serial numbers. The magnetic force required to properly bend the beam in the new tubes is considerably less than that required in earlier tubes. As a result, if a 58-gauss magnet, as found in early RA-109A, RA-112A and RA-113 Telesets, is used with one of the new Teletrons it is necessary to place it near, and in some cases on, the tube base, to secure a raster on the

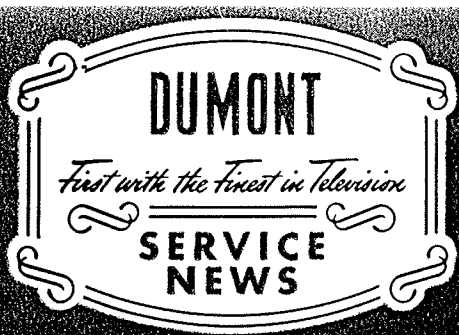
screen. Proper adjustment of the magnet may also be accomplished by placing a magnetic shunt (a paper clip may be used) across the poles of the magnet. This weakens the field produced by the magnet allowing it to be located nearer to the position specified in the installation instructions.

All Du Mont Telesets currently being produced are equipped with Teletrons using the redesigned gun. These Telesets use lower-strength magnets which are color-coded for identification, as indicated in the chart below.

Ion-traps should always be adjusted for maximum brilliance. If an ion-trap is incorrectly adjusted or if it is used to position the picture on the cathode-ray tube screen, the life of the tube may be drastically reduced. This is particularly true with respect to the 30BP4. Because of the high-anode voltage at which this tube is operated, damage due to improper ion-trap setting can occur within a few seconds. Ion-traps used with 30BP4's should be adjusted with the lowest possible Brightness-control setting. The Brightness control should never be advanced to its maximum setting until the ion-trap is properly positioned.

Part Number	Min. E _{acc}		Color Code	Teleset	CRT
	In KV	Gauss			
21004472	8.0	52±3		RA-103C	12QP4
	8.0			RA-103C	12RP4
	8.0			RA-103D	12QP4
	8.0			RA-104A	15DP4
	8.0			RA-110A	19AP4
	8.0			RA-111A	12QP4
21004473	12.0	58±3		RA-105B	15DP4
	12.0			RA-108A	19AP4
	14.0			RA-109A	19AP4A
	11.5			RA-112A	19AP4A
	11.5			RA-113	17AP4
	10.0			RA-117A	17AP4
	22.5			RA-119A	*30BP4A
	21004852			8.0	52±3
8.0	RA-104A	15DP4			
8.0	RA-110A	19AP4			
8.0	RA-111A	12QP4			
21004853	12.0	58±3		RA-105B	15DP4
	12.0			RA-108A	19AP4
	14.0			RA-109A	19AP4A
	11.5			RA-112A	19AP4A
	11.5			RA-113	17AP4
	11.5			RA-113	17BP4A
	14.0			RA-116A	19AP4A
	10.0			RA-117A	17AP4A
21006931	14.0	42±3	Blue	RA-109A	19AP4A
	11.5			RA-112A	19AP4A
	11.5			RA-113	17AP4A
	11.5			RA-113	17BP4A
	14.0			RA-116A	19AP4A
	11.5			RA-120	17BP4A
21006932	10.0	35±3	Red	RA-117A	17AP4A

* 21004473 plus a magnetic shunt



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DIRECTORS CORNER

BY
Harold J. Schulman
DIRECTOR OF SERVICE

The other day we were talking about the qualifications of a good television serviceman. No one disagreed with the accepted requirement of sufficient technical know-how.

But there is more to it than just that!

For instance, you've got to deal in most cases, with women who can't properly tune an a-m radio. Now you must teach them about contrast, focus and fine tuning. Therefore, a bit of the patient professional instructor must be part of the serviceman's make-up. Don't just tell. Demonstrate. Have the new television set owner go over the tuning procedure several times under your direction, until you are sure she'll retain the information, at least until her husband comes home. It is also a good idea to have the customer go over her tuning routine during later service calls. It is a sad fact that there are too many people who don't get the best results their Telesets are capable of producing, because of lack of proper tuning instruction.

Occasionally, you may have to explain reception difficulties due to location, interference, or transmission troubles. First, be sure you're right in your diagnosis. Then explain your findings as patiently as you can. Don't talk down to your customers by impressing them with your technical vocabulary. Make your explanation short, simple and non-technical. A combination salesman and psychologist is needed here.

Always "sell" the set you're working on. Its owner wants to be proud of her purchase. She needs to be assured that a service call does not mean she has a poor set. It's part of your job to provide that assurance.

Another obvious qualification is neat

(CONTINUED ON PAGE 32)

19 INCH BENCH SETUP

Kits for use in assembling 19-inch CRT bench setups are now available through your Du Mont Distributor. The kits include all material required, with the exception of the 19-inch CRT and several wooden parts which may easily be made up in the shop.

If a 19-inch CRT is desired for use in the bench setup, it should be ordered separately.

NEW TOOLS

Three tools, necessary for the alignment of Du Mont Telesets, are now available through your Du Mont Distributor. The purpose of each tool and its part number is shown below:

Part Number	Description
69 000 230	Used to adjust large and small recessed hex head slugs
69 000 220	Used to adjust slugs having screw driver slot.
69 000 210	Used to adjust slugs having slotted machine screws.

RA-109A POWER TRANSFORMER BUZZ

Power transformer buzz is sometimes encountered in RA-109A Telesets. This buzz is primarily due to vibration of the core structure of the transformer at a 60 cycle rate. These vibrations are transmitted to the chassis and cabinet. The room in which the Teleset is installed and the furnishings in that room can, under certain conditions, aggravate the trouble. Such conditions will occur when the wall behind the Teleset is highly reflective, especially if the Teleset is placed catty-corner in the room or when the dimensions of the floor, walls or other parts of the room are such that they will efficiently transmit 60 cycle energy.

The buzz can be reduced to a satisfactory level, in the majority of cases, by shock mounting the transformer. In the future, the power transformers in all RA-109A Telesets will be shock mounted in production.

A modification kit for use in shock mounting RA-109A power transformers in the field is available from your Du Mont Distributor, without charge. The part number of the kit is 87 000 211. Replacement transformers modified for shock mounting are also available. The part number of the transformer is 20 004 964. Instructions are included with the kit and the modified transformer.

SERVICE NOTES

To check for a dirty capstan on the RA-116A recorder, stall the feed reel by touching it with your finger. If the heads do not throw out, the capstan is dirty.

To clean the capstan remove the three screws holding the housing section directly over the capstan, and remove the housing. Set the control lever midway between "Record or Play" and "Load or Rewind."

The capstan should be cleaned by moistening a cloth with carbon tetrachloride and holding it against the

capstan while the machine is running. The recording and erase heads should be cleaned at the same time by gently rubbing the areas around the gaps with the moistened cloth.

A BTO transformer (T201) with an open primary in an RA-103D, RA-104A or RA-110A Teleset, can be temporarily repaired by disconnecting R273 from the red primary lead of the transformer and connecting it to the yellow secondary lead. This procedure should be used as a temporary measure only. The transformer should be replaced when a new part is available.

Eliminating Diathermy Interference

Medical diathermy equipment has been assigned frequencies of 13.56, 27.12 and 40.68 mc by the FCC. Diathermy equipment operating on 13.56 mc will rarely be encountered and since there is no equipment operating on 40.68 mc at the present time, the information in this article has been confined to interference from 27.12 mc diathermy equipment.

A severe case of diathermy interference usually occurs when diathermy equipment is located close to a Teleset. Such a case will occur in a doctor's home, where diathermy equipment and a Teleset may be separated by less than six feet. Figure D-1 shows a typical interference pattern produced by a diathermy machine.

Experience in eliminating diathermy interference in its most severe form has dictated the following approach:

1. Check to insure that coaxial-cable transmission line is in use. If not, install same.
2. Determine which TV channels show interference when the diathermy equipment is in operation.
3. Disconnect the antenna from the Teleset and short the antenna input terminals to ground. Again determine which channels show interference when the diathermy equipment is in operation. The interference which remains (if any) is being picked up directly by the wiring of the Teleset.
4. If interference is still observed, insert an a-c power line filter in the Teleset a-c line cord. A suitable filter is shown in Figure D-2. It is available from your Du Mont distributor. The part number is 21 007 651. The filter should be installed as close as possible to the point where the a-c line cord enters the Teleset chassis.
5. If interference still remains (antenna terminals shorted):
 - a. Mount the a-c power line filter inside of the cabinet.
 - b. Completely shield the interior and back of the Teleset cabinet, including the record player compartment, if one is incorporated in the Teleset. Use copper screen of 14 x 18, or finer mesh.
 - c. If the Teleset includes a record player, ground the record-player

metal platform to the shielded pick-up lead. Ground the pick-up lead shield to the screen lining where possible.

6. Remove the short across the antenna input terminals and reconnect the antenna. Check for any remaining interference. If interference is still present, install a trap at the antenna input. If copper screening has been installed, the trap should be mounted inside of the Teleset. The circuit of a suitable trap is shown in Figure D-3. The trap consists of two 4-foot lengths of coaxial cable each wound in the form of a spiral and attached, one on top of the other, to a piece of

cardboard or other material as shown in Figure D-4. The trimmer capacitors should be of the silvered ceramic type. After installation the trap should be adjusted to minimize the interference.

Antenna traps for the elimination of diathermy interference will be available from your Du Mont distributor in the near future. Notification of the availability of these traps will appear in the SERVICE NEWS.

Slight interference may remain on channels 2, 5, 9 and 13 due to their harmonic relationship to 27.12 mc. It is also possible for images of harmonics to cause slight interference on

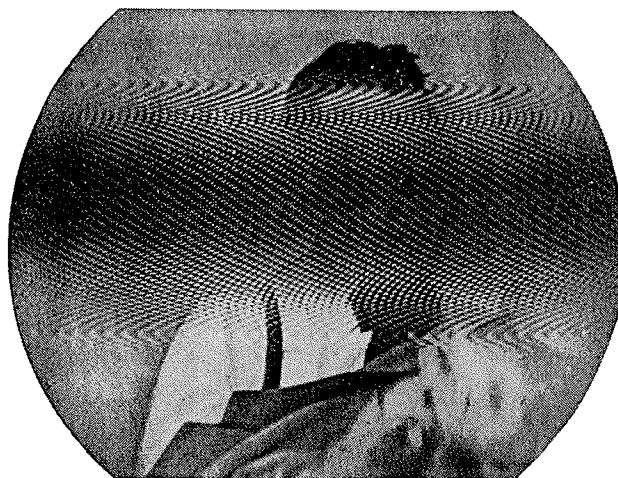


Figure D-1. Diathermy Interference.

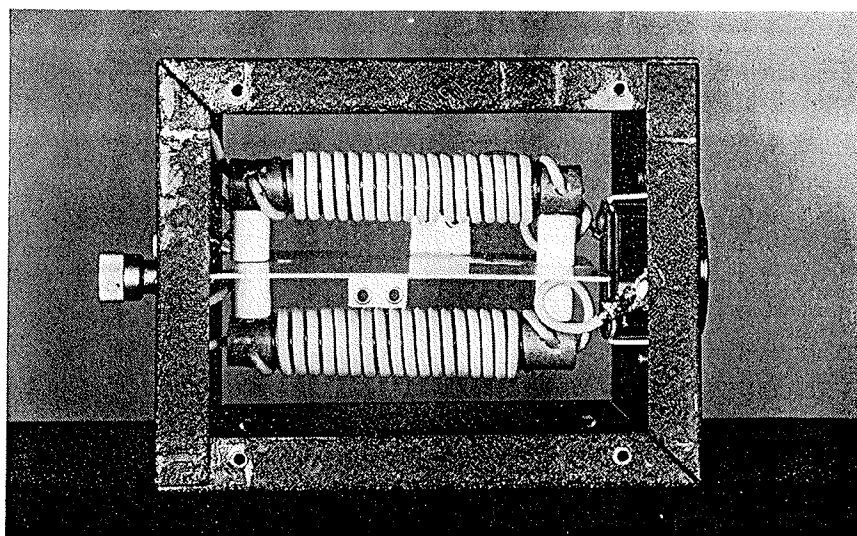


Figure D-2. Power Line Filter.

channels 2 and 6, although this is not common. Reduction of such harmonic interference can be accomplished by separating the Teleset, its antenna and coaxial lead in, as far as possible from the interference source. Ground the coaxial cable at every convenient point along its path. A directional antenna with high front-to-back ratio will often help, if the direction of the TV stations from the Teleset location permits orientation favoring the TV stations.

In most cases of diathermy interference not all of the above measures will be necessary. In less severe cases antenna pick-up may be the only problem. If this condition is encountered only step 6 is required. The complete procedure will have to be resorted to only when the Teleset is located within a few feet of the diathermy equipment.

Figure D-5 shows an RA-108A Bradford modified in accordance with the complete procedure above. This Teleset was field tested in several adverse locations.

In one case, 28 miles airline from New York City, the modified Teleset displayed moderate interference on channels 2 and 5 (2nd and 3rd harmonic of 27.12 mc, respectively) with no interference on channels 4, 7, 9, 11 and 13 when operated within three feet of a diathermy machine operating on 27.12 mc. A similar unmodified Teleset was unusable on any channel when the diathermy equipment was in use.

In another case, 8 miles airline from Philadelphia, the modified Teleset displayed absolutely no interference on any channel in use (3, 6 and 10), when located within fifteen feet of three diathermy machines operating on 27.12 mc. A similar unmodified Teleset displayed severe interference on all three of these channels, when the diathermy equipment was in use.

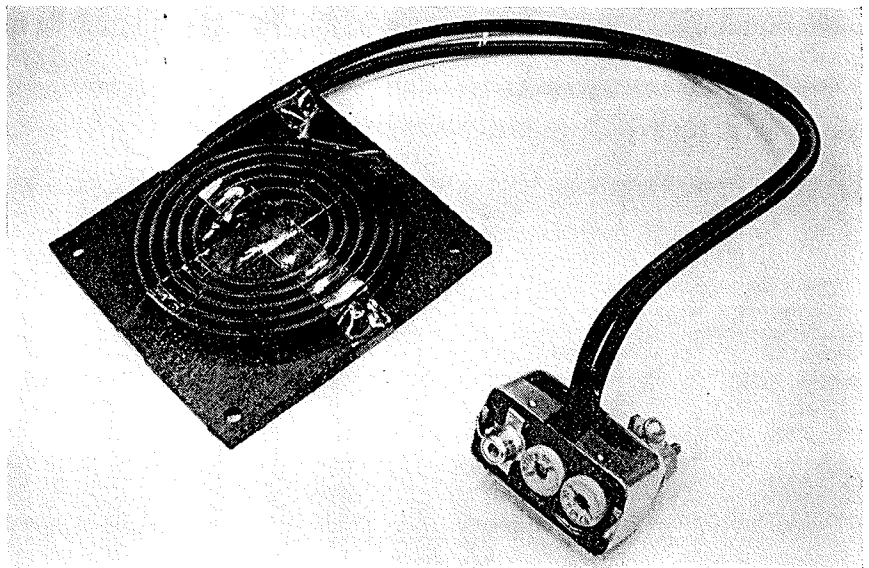


Figure D-4.

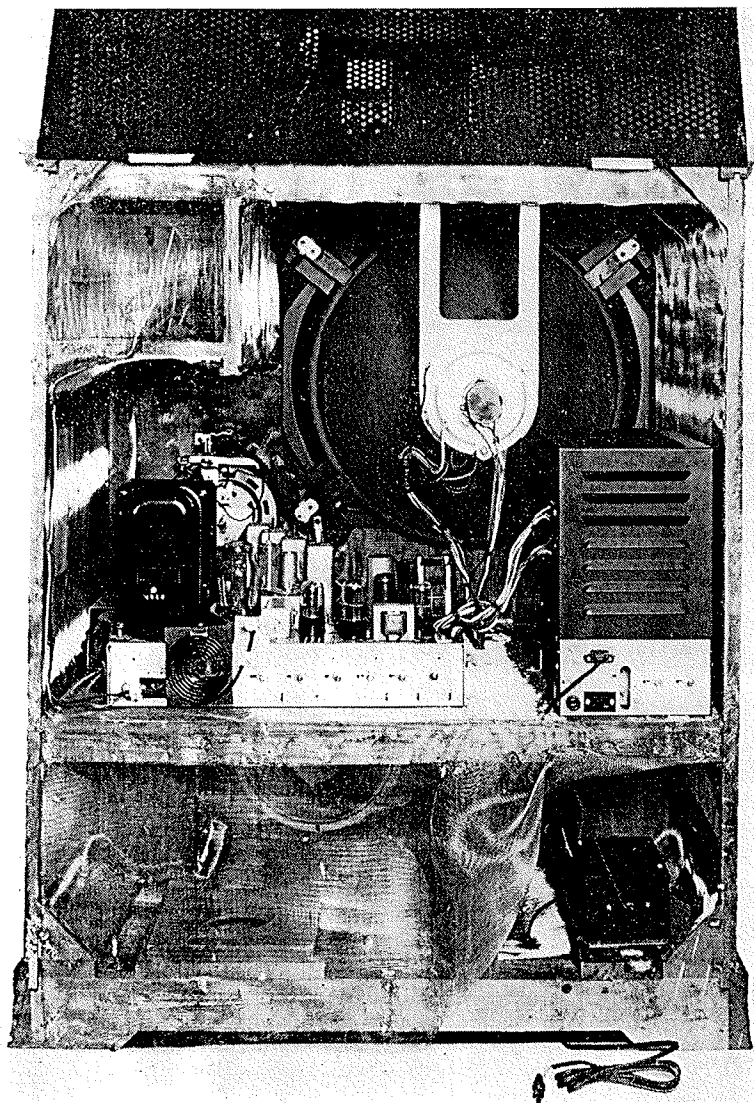


Figure D-5.

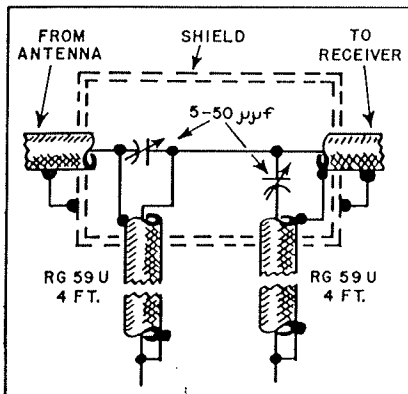


Figure D-3.

PRODUCTION CHANGES

RA-109A

Change No. 43 (ECN-4870)

Reason:
To reduce audible 60 cycle hum.

Procedure:
The power transformer T203 is shock mounted. A kit with installation instructions is available to modify existing Telesets which exhibit this difficulty.

Parts Required:

PART NUMBER	DESCRIPTION
87 000 211	Kit shock mounting

The first chassis so modified is:
RA-109A — No. 0959567

Change No. 44 (ECN-4867)

Reason:
To reduce "snow" on weak signals. The a-g-c delay voltage is increased, resulting in an increase in the signal level at the grid of the first i-f stage when receiving weak signals. This enables the signal to override the "snow" caused by tube noise in the i-f amplifiers.

Procedure:
Change R355, near V227B from 10 meg. to 8.2 meg.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R355	02 032 240	Res F C 8.2 meg 10% 1/2 W
	02 042 240	
	02 052 240	

The first chassis so modified is:
RA-109A — No. 0959931

Change No. 45 (ECN-4858)

Reason:
To make obvious the need for freeing the record changer from the shipping position, by loosening the shipping screws when installing a Sherbrooke Teleset. Formerly the shipping screws were flush with the changer base plate, when the changer was in the shipping position, and were often overlooked. The new screws protrude about one-half inch above the changer, and the changer is loosened by screwing them down flush with the changer base plate. The record changer may be removed from the phono drawer by pulling down the arm of the three speed clips. The record changer may then be lifted out of the drawer. The speed clips are accessible through holes provided in the bottom of the changer drawer.

The first chassis so modified is RA-109A — No. 0958000.

RA-112A — RA-113

Change No. 52 (M-254)

Reason:
To increase the effectiveness of the Channel 5 beat interference traps added by Change No. 33. The beat was caused by the 3rd harmonic (78.75 mcs) of the video i-f carrier (26.25 mcs) which was radiated from the CRT leads and combined with the carrier of Channel 5 (77.25 mcs) to produce a 1.5 mc beat. The fixed trap in the cathode lead of the CRT is deleted and a tuneable trap is added from the plate of the video amplifier to ground. A 100 mmf capacitor is added from the filament of V209 to ground to prevent coupling, between V209A the video detector, and V209B, the d-c restorer, through their common filament. The new circuits are illustrated in Figure P-1.

- Procedure:**
1. Delete L220.
 2. Connect the free end of brown lead, previously connected to L220, to the junction of C285, R242 and R317.
 3. Rotate the terminal strip to which the jumper from the plate of V210 attaches, about 15° away from V210.
 4. In the space made available by step 3, make a hole as shown in Figure P-2. If a punch is not available, the hole may be drilled using 5/16 inch and 3/64 inch drills.
 5. Mount L221 in the hole.
 6. Connect the side of L221, nearest the terminal board, to the junction of the jumper from the plate of V210, R305 and L202.
 7. Connect C308 from the other side of L221 to the nearest ground lug.
 8. Add C309 from V209-4 to ground, keeping its leads about one-half inch long.
 9. Tune the receiver to Channel 5 and, observing the beat

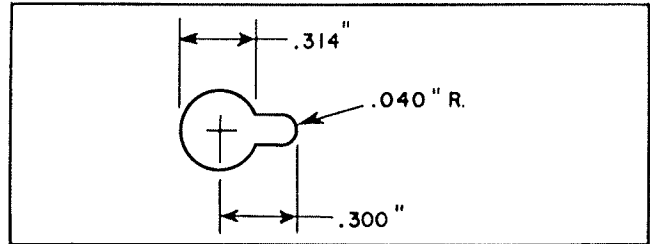


Figure P-2. Change No. 52, RA-112A - RA-113.

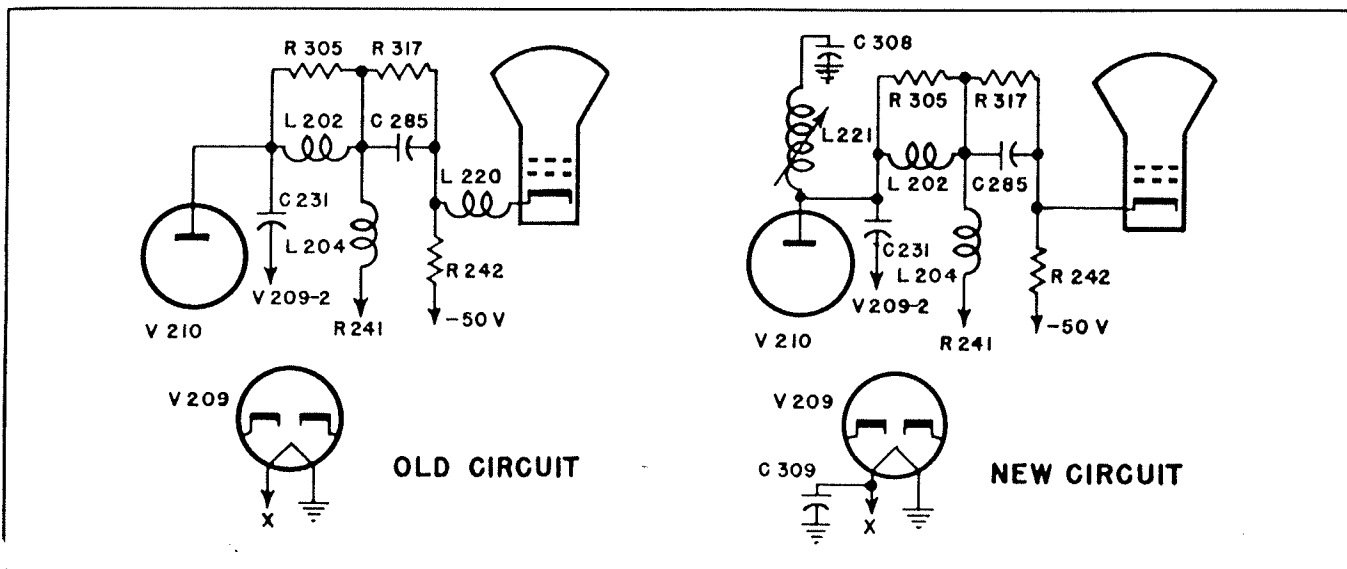


Figure P-1. Change No. 52, RA-112A - RA-113.

interference, tune L219 and L221 until the interference disappears.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C308	03 055 500	Cap F M 5 mmf 10% 500V
C309	03 055 170	Cap F M 100 mmf 5% 500V
L221	21 007 132	Coil, variable

The first chassis so modified are:

RA-112A	— No. 1259349	Coded "A-H"
RA-113	— No. 1354552	Coded "A-H"

RA-117A

Change No. 19 (ECN-4792)

Reason:

Certain wiring changes have been made to facilitate assembly. The first chassis so modified is RA-117A — No. 1718480 — Coded "K".

Change No. 20 (ECN-4845)

Reason:

To increase the effectiveness of the Channel 5 beat interference trap, the lead between C227 and ground is shortened.

Procedure:

1. Remove C227 from L219 and ground at V209-6.
2. Disconnect the jumper running from L219 to V209-7 at L219, reconnecting it to the other terminal of L219 to which C227 was attached.
3. Connect C227 from the terminal of L219, to which the wire jumper was formerly attached, to ground, at the tab to which C220 and L212 are connected.

The first chassis so modified is: RA-117A — No. 1723000

Change No. 21 (W-6931)

Reason:

To prevent failure of R281 due to overheating.

Procedure:

Replace R281A and B with a 1K, 10%, 10W resistor and a 200 ohm, 10%, 10W resistor, mounted as shown in Figure P-3.

Parts Required:

PART NUMBER	DESCRIPTION
02 113 280	Res F W 200 ohms 10% 10W
02 112 960	Res F W 1K 10% 10W
40 005 760	Strip Terminal 3 position

The first chassis so modified is: RA-117A — No. 1717533

RA-119A

Change No. 1 (S-31)

Reason:

To eliminate H.V. instability. This instability is due to fluctuations in the plate voltage of the control reference tube V308, caused by insufficient plate current. The plate load resistor R325, is decreased in value to correct this condition.

Procedure:

Change R325 from 100K to 25K.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R325	02 108 110	Res F W 25K 5% 10W.

The first chassis so modified is: RA-119A — No. 1942

Change No. 2 (S-29)

Same as RA-109A. Change No. 44.

The first chassis so modified is: RA-119A — No. 191

Change No. 3 (S-32)

Reason:

To reduce the voltage on the -12 line, in the main chassis, to the correct level. Due to differences between the supply circuits of the RA-109A and the RA-119A, the -12 volt line was found to be running at -16V in the RA-119A.

Procedure:

Add R611 from the junction of R303A, R303B and C295 to ground.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R611	02 036 270	Res F C 130 ohms 5% 2W

The first chassis so modified is: RA-119A — No. 1961

Change No. 4 (S-36)

Reason:

To specify the correct ion trap for the new type of gun structure.

Procedure:

Change the ion trap to the new type.

Parts Required:

PART NUMBER	DESCRIPTION
21 006 933	Ion Trap

The first chassis so modified is: RA-119A — No. 19102

Change No. 5 (S-37)

Reason:

To eliminate the 31.5 kc high voltage oscillator signal from the video circuits.

Procedure:

Add C330, from the junction of the +338 volt line and K302, to ground, in the high voltage chassis.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C330	03 012 560	Cap F Pa .01 mf 20% 600V

The first chassis so modified is: RA-119A — No. 19118

Change No. 6 (S-38)

Reason:

To eliminate resistor failure in the H.V. bleeder circuit. Due to the capacitance between ground and the corona button connections used in the H.V. bleeder circuit, R338 was absorbing most of the RF pulse energy and R333 the least. Under these conditions R338 was overheating.

Procedure:

1. Change R333 from 470K to 820K.
2. Change R334 from 470K to 560K.
3. Change R336 from 470K to 330K.
4. Change R337 from 470K to 180K.
5. Change R338 from 470K to 100K.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
R333	02 038 120	Res F C 820K 10% 2W
R334	02 038 100	Res F C 560K 10% 2W
R336	02 038 070	Res F C 330K 10% 2W
R337	02 038 040	Res F C 180K 10% 2W
R338	02 038 010	Res F C 100K 10% 2W

The first chassis so modified is: RA-119A — No. 19118

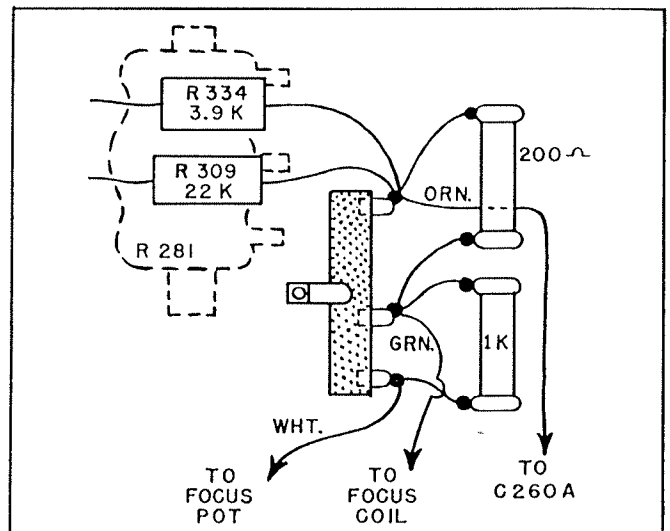


Figure P-3. Change No. 21, RA-117A.

PARTS LIST CHANGES

RA-109A

Main Chassis

SYMBOL	PART NUMBER	DESCRIPTION
<i>Delete:</i>		
C238	03 014 820	Cap F Pa .1 mf 20% 600V
	03 100 260	
C239	03 018 370	Cap F Pa .05 mf 20% 200V
	03 100 030	
C241	03 014 810	Cap F Pa .01 mf 20% 600V
	03 100 220	
C249	03 014 780	Cap F Pa .1 mf 20% 200V
	03 100 040	
C251	03 014 780	Cap F Pa .1 mf 20% 200V
	03 100 040	
C258	03 014 820	Cap F Pa .1 mf 20% 600V
	03 100 260	
C310	35 008 721	Cap E 2 mf approx.
R355	02 032 250	Res F C 10 meg 10% 1/2W
	02 042 250	
	02 052 250	
T203	20 004 961	Transformer Power
<i>Add:</i>		
C238	03 100 260	Cap F Pa .1 mf 20% 600V
	03 014 820	
C239	03 100 030	Cap F Pa .05 mf 20% 200V
	03 018 370	
C241	03 100 220	Cap F Pa .01 mf 20% 600V
	03 014 810	
C249	03 100 040	Cap F Pa .1 mf 20% 200V
	03 014 780	
C251	03 100 040	Cap F Pa .1 mf 20% 200V
	03 014 780	
C258	03 100 260	Cap F Pa .1 mf 20% 600V
	03 014 820	
C310	35 008 722	Cap FE 2 mf approx.
R355	02 032 240	Res F C 8.2 meg 10% 1/2W
	02 042 240	
	02 052 240	
T203	20 004 962	Transformer, Power
<i>Delete Alternates:</i>		
R206	02 031 670	Res F C 150 ohms 10% 1/2W
R300	02 031 740	Res F C 560 ohms 10% 1/2W
<i>Add Alternates:</i>		
R283	02 121 400	Res F W 3 Section
	02 118 910	

RF Tuning Assembly

<i>Delete:</i>		
	89 003 013	Inputuner Assembly
<i>Add:</i>		
	89 003 015	Inputuner Assembly
<i>Add Alternates:</i>		
V102	25 002 020	Tube Elec. 6BC5
	25 002 760	Tube Elec. 6CB6

Sherbrooke

Miscellaneous Parts List

<i>Delete:</i>		
	19 034 582	Reproducer Sound
<i>Add:</i>		
	19 034 691	Reproducer Sound

RA-112A — RA-113 — RA-117 — RA-120

Main Chassis

<i>Delete:</i>		
C225	03 014 770	Cap F Pa .1 mf 20% 400V
	03 100 130	

C258	03 104 770	Cap F Pa .1 mf 20% 400V
	03 100 130	
C261	03 014 780	Cap F Pa .1 mf 20% 200V
	03 100 040	
C262	03 014 770	Cap F Pa .1 mf 20% 400V
	03 100 130	
C268	03 014 820	Cap F Pa .1 mf 20% 600V
	03 100 260	
C269	03 101 340	Cap F Pa .1 mf 10% 600V
	03 103 590	
C310	03 014 780	Cap F Pa .1 mf 20% 200V
	03 100 040	
L220	21 005 411	Trap Fixed 79 mcs
T203	20 004 724	Transformer Vert. Blocking
	38 003 423	Cushion Rear Support CRT
	38 003 422	Cushion Rear Support

Add:

C225	03 100 130	Cap F Pa .1 mf 20% 400V
	03 014 770	
C258	03 100 130	Cap F Pa .1 mf 20% 400V
	03 014 770	
C261	03 100 040	Cap F Pa .1 mf 20% 200V
	03 014 780	
C262	03 100 130	Cap F Pa .1 mf 20% 400V
	03 014 770	
C268	03 100 260	Cap F Pa .1 mf 20% 600V
	03 014 820	
C269	03 103 590	Cap F Pa .1 mf 10% 600V
	03 101 340	
C308	03 055 500	Cap FM 5 mmf 10% 500V
C310	03 100 040	Cap F Pa .1 mf 20% 200V
	03 014 780	
L221	21 007 132	Trap Tunable 78.75 mcs
	38 003 862	Cushion Rear Support CRT
	38 003 861	Cushion Rear Support CRT
T203	20 004 726	Transformer Vertical Blocking

Add Alternate:

C269	03 101 340	Cap F Pa .1 mf 10% 600V
	03 103 590	

RA-112A — RA-113

RF Tuning Assembly

Add Alternate:

V102	25 002 020	Tube Elec. 6BC5
	25 002 760	Tube Elec. 6CB6

RA-117

Miscellaneous Parts List

<i>Delete:</i>		
	45 002 352	Knob Tuning Mahogany
	45 002 351	Knob Tuning Blonde
<i>Add:</i>		
	45 003 152	Knob Tuning Mahogany
	45 003 151	Knob Tuning Blonde

RA-120

RF Tuning Assembly

Add Alternate:

V102	25 002 020	Tube Elec. 6BC5
	25 002 760	Tube Elec. 6CB6

RA-119A

Main Chassis

<i>Delete:</i>		
R355	02 032 250	Res F C 10 meg 10% 1/2W
	02 042 250	
	02 052 250	

Parts List Changes (Cont.)

<i>Add:</i>		
R355	02 032 240	Res F C 8.2 meg 10% 1/2W
	02 042 240	
	02 052 240	
R611	02 036 270	Res F C 130 ohms 5% 2W

High Voltage Chassis

<i>Delete:</i>		
R325	02 038 010	Res F C 100K 10% 2W
R333	02 038 090	Res F C 470K 10% 2W
R334	02 038 090	Res F C 470K 10% 2W
R336	02 038 090	Res F C 470K 10% 2W
R337	02 038 090	Res F C 470K 10% 2W
R338	02 038 090	Res F C 470K 10% 2W

<i>Add:</i>		
C330	03 012 560	Cap F Pa .01 mf 20% 600V
R325	02 108 110	Res F W 25K 5% 10W
R333	02 038 120	Res F C 820K 10% 2W
R334	02 038 100	Res F C 560K 10% 2W
R336	02 038 070	Res F C 330K 10% 2W
R337	02 038 040	Res F C 180K 10% 2W
R338	02 038 010	Res F C 100K 10% 2W

INTERCHANGING INPUTUNERS

It is possible to interchange the various Inputuners used in RA-112A, RA-113 and RA-109A. The chart below lists the sources of information on such changes.

To Substitute	Remarks
RA-109A	
89 003 011 for 89 003 002	See page 109-5R in Service Notes.
89 003 013 for 89 003 002	Follow same procedure as used to substitute 89 003 011 for 89 003 002, above.
89 003 013 for 89 003 011	Directly interchangeable.
RA-112A — RA-113	
89 003 911 for 89 003 902	See page 112-6D, Change No. 10, in Service Notes.
89 003 911 for 89 003 901	Follow same procedure as used to substitute 89 003 911 for 89 003 902, above.
89 003 912 for 89 003 911	See page 112-6N, Change No. 28, in Service Notes.
89 003 912 for 89 003 913	Directly interchangeable.
89 003 015 for 89 003 013 or 89 003 011	Connect the tinned twinex lead to ground at L215. Connect the bare twinex lead to the junction of L215 and Z204-2.
89 003 915 for 89 003 912 or 89 003 913	Remove the grounded end of C301 from ground and connect it to the tinned twinex lead from the tuner. Connect the bare twinex lead to the junction of C301 and Z204-3.

TROUBLESHOOTING HINTS**Teleset: RA-101A**

Symptom: No high voltage.

Probable Fault: R43 and R45, the 47K 1W resistors between the second anode of the CRT and the high-voltage rectifiers, is burned out.

Remedy: Replace with 2 watt units.

Teleset: RA-101B

Symptom: No brightness.

Probable Fault: R51, the 20K resistor at the screen of V14 (6L6G, high-voltage oscillator) is open.

Remedy: Replace R51.

Teleset: RA-109A

Symptom: Tuneable hum when Selector Switch is in Tele position and Tone control is set for maximum, or near maximum bass. 60 cycle ripple on a-g-c line. Hum disappears when Selector Switch is placed in FM position.

Probable Fault: A-g-c control not adjusted properly.

Remedy: Reset the a-g-c control.

Teleset: RA-112A and RA-113

Symptom: Setting of contrast control is critical.

Probable Fault: L203, in the grid circuit of the video amplifier (V210), is open.

Remedy: Replace L203.

Teleset: RA-112A and RA-113

Symptom: Fine tuning or fine and coarse tuning knobs cannot be turned or are difficult to turn at one point in each rotation. In some cases the Teleset does not tune as the vernier knob is rotated.

Probable Fault: The tuner dial assembly vernier gear is split.

Remedy: Replace the assembly shaft and vernier gear. Instructions for the replacement are included with the part. The part number is 30 026 441.

Teleset: RA-112A, RA-113 and RA-117A

Symptom: Interaction between Contrast and Brightness controls; when contrast is turned up the brightness increases.

Probable Fault: L202 in plate of V210 is open.

Remedy: Replace L202.

Teleset: RA-112A, RA-113 and RA-117A

Symptom: No picture. Raster varies

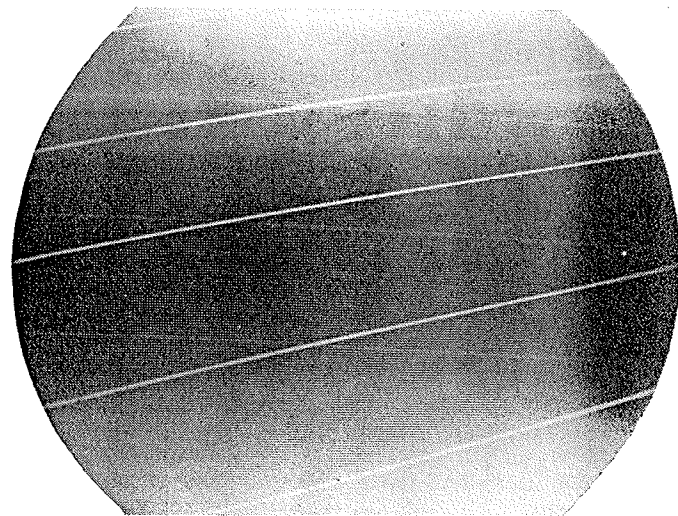


Figure T-1.

in brightness from top to bottom forming a wide dark band as shown in Figure T-1. When Selector Switch is placed in the FM position, raster remains on screen but is not in sync. In some cases the picture will appear and disappear rapidly when switch is in Tele position.

Probable Fault: Heater-cathode leakage in the CRT.

Remedy: Replace the CRT.

Teleset: RA-117A

Symptom: Picture cannot be focused, raster size reduced and cutoff, as shown in Figure T-2.

Probable Fault: 900 ohm section of R281 open.

Remedy: Replace R281. See Production Change number 21.

Teleset: RA-117A

Symptom: Microphonics in sound.

Probable Fault: The oscillator tube (V103) shield is loose or the oscillator tube is microphonic.

Remedy: Tighten the shield, if this does not correct the condition, try another tube.

Teleset: RA-119A

Symptom: No high voltage.

Probable Fault: Filament of V306 (1B3), in high-voltage power supply open. The filament winding of V306 is improperly positioned on the high-voltage transformer.

Remedy: Move the filament winding of V306 3/16 inch further from the high-voltage winding. Replace V306.

Teleset: RA-119A

Symptom: Picture very bright and reduced to half normal height. Vertical sweep failure protection relay closes, when Teleset is turned on, and then continues to open and close.

Probable Fault: C315, the .05 mf capacitor in the plate circuit of V312B, on the power supply chassis, is shorted. R317, at the cathode of V313, burned out.

Remedy: Replace C315 and R317. C315 should be replaced with a 1000 volt capacitor.

Teleset: RA-119A

Symptom: Dark vertical line, ap-

proximately five inches from the right side of the picture. In severe cases, two or more lines appear.

Probable Fault: The 31.5 kc signal of the high-voltage power supply is entering the video i.f.'s.

Remedy: Bypass the 338 volt B+ line in the high-voltage chassis by connecting a .01 mf, 600 volt capacitor from the B+ side of the solenoid of K302 to ground.

Teleset: All using metal cone CRT's.

Symptom: Distorted picture and raster, as shown in Figure T-3.

Probable Fault: The metal cone of the tube is magnetized.

Remedy: Locate the magnetized area of the CRT cone with a compass. Demagnetize the cone by passing it through a strong alternating magnetic field. Such a field may be produced by removing the case from a focus coil and passing a.c., obtained from a Variac, or other suitable source, through the coil. The flat side of the coil should be passed over the magnetized area of the cone. The a.c. should not be interrupted while the coil is near the tube.

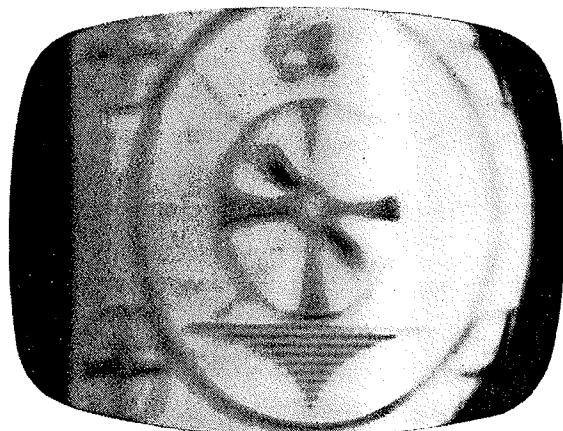


Figure T-2.

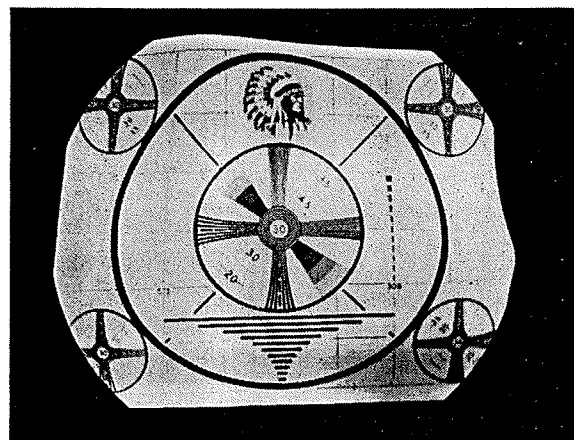


Figure T-3.

DIRECTOR'S CORNER (CONT.)

appearance. You reflect discredit on yourself, your company and the set you service, when you show up at a customer's house unshaven and disheveled. This fact is obvious to most of us, but simple observation will prove that some servicemen violate the rule.

We can add further to the list. One fact seems to stand out though. With all the knowledge and skill our television servicemen need to carry out their appointed tasks, professional status must someday be accorded them.

PICTURE CUT-OFF IN RA-119A

When picture cut-off is encountered during the installation of an RA-119A Teleset it can often be eliminated by using the following procedure.

1. Remove the yoke and focus coil assembly.
2. Move the yoke as far forward as possible in the deflection-yoke-assembly mounting and tighten the thumb screw.

3. Loosen the screw fastening the CRT support strap to the rear CRT support.
4. Replace the yoke and focus coil assembly, bringing the yoke flush against the CRT and tighten the yoke and focus coil assembly mounting screws.
5. Tighten the screw fastening the CRT support strap to the rear support.



DIRECTORS CORNER

BY
Harold J. Schulman

Quality is something which we of Du Mont practically revere. Many of you reading these lines have been part of our service family and working with us for many years. You can probably speak more eloquently than I to our new friends — the servicemen in recently opened distributor territories — about the quality built into Du Mont Telesets to make the serviceman's life easier.

As part of the curriculum of our factory Service School, students are taken on a tour of the plant. Without exception, servicemen, observing our manufacturing process and quality control, are deeply impressed by the many, many inspections and tests a chassis goes through before it passes our watchful final inspection.

No doubt a wry smile crosses your face as you recall a particular chassis which made you wonder whether all the talk about final inspection was just talk. Most of us are great artists when it comes to drawing "inaccurate conclusions from insufficient observations."

This fallacy in reasoning is brought out by the following classical bit:

"I see that Indians like to walk in single file."

"How do you know?"

"Well, the one I saw was."

The production of a television receiver is a complicated process requiring a tremendous amount of planning, organization and coordination. At Du Mont many high quality components must be available to many skilled people, who assemble many fine chassis for inspection by many critical inspectors.

(CONTINUED ON PAGE 40)

FRINGE AREA ALIGNMENT

THE POSITION OF the video carrier on a receiver's video i-f response curve, plays an important part in the fringe area performance of the receiver.

An ideal video i-f response curve is shown in Figure R-1.

The linear reduction in response in the vicinity of the video carrier is required to obtain a flat response to video modulating frequencies between 0 and 4 mc. Under present television standards quasi-single-sideband transmission is used. Both sidebands of video modulating signals below 0.75 mc are transmitted, while the lower sideband of video modulating signals above 0.75 mc is attenuated before transmission.

Since both sidebands of video modulating frequencies below 0.75 mc are transmitted the modulation energy of these signals is twice that of signals above 0.75 mc. If the video carrier and all of its sidebands were amplified equally by the receiver video i-f stages,

video frequencies below 0.75 mc would produce twice as much video detector output as signals above 0.75 mc.

To correct this condition the response of the video i-f strip is reduced in the vicinity of the carrier as shown in Figure R-1. Both sidebands of video modulating frequencies below 0.75 mc are passed, but sufficient reduction in response is provided to equalize the amplitudes of high and low video frequencies in the output of the detector.

While the response of the average television receiver does not match the ideal curve, it is approached in well designed and properly aligned receivers.

On the ideal curve the video carrier is shown 50% down from maximum response. In most receivers the carrier will actually be located between 50% and 60% down.

If the carrier is 70 to 80% down from maximum response, as it sometimes is if the receiver is not carefully

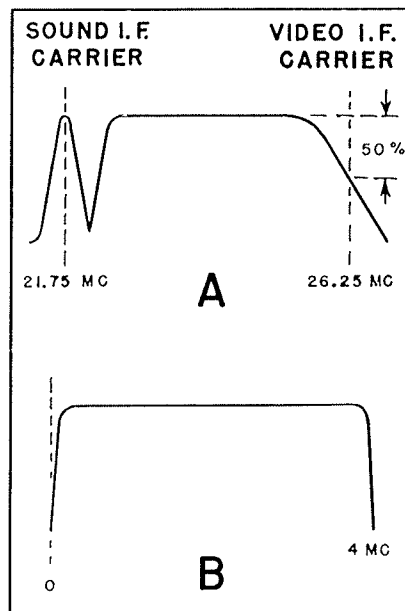


Figure R-1A. I-f passband-B, overall response to video modulating frequencies.

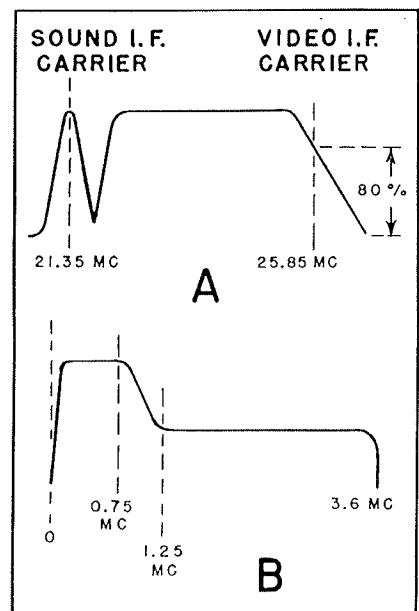


Figure R-2A. I-f passband-B, overall response to video modulating frequencies.

aligned, the receiver will usually perform satisfactorily in strong signal areas. In a fringe area however, very poor results will be obtained. The picture will be snowy and lack contrast, and the sync noise immunity will be poor. By repositioning the carrier on the response curve better results can be obtained.

Raising the carrier to the correct point (50% down) will equalize the low- and high-frequency response, as shown in Figure R-1A. If the carrier position is raised above the 50% point the low-frequency response will be further increased, but there will be a loss in high-frequency response, as illustrated in Figure R-2. Here the carrier is at the 80% point on the response curve.

In a strong signal area positioning the carrier above the 50% point will degrade the picture quality. In a weak signal area however, the picture may be considerably improved. On weak signals the high-frequency video-signal components are obscured by noise (snow). Therefore a moderate loss in high-frequency response has no noticeable effect on the picture. The increase in low-frequency response obtained by raising the carrier position will improve picture contrast and sync noise immunity and is therefore desirable.

The improvement in weak signal reception, which can be secured by repositioning the video carrier, may be checked as follows.

1. Tune the receiver to a weak channel in the normal manner.
2. Slowly tune the receiver lower in frequency and note the effect on the picture. If there is a significant im-

provement in the picture as the receiver is detuned, the video carrier should be raised on the video i-f response curve.

On very weak signals an improvement will be noted even though the carrier is at the theoretically correct point on the video i-f response curve. This indicates that carrier positions above the 50% point will give improved reception on weak signals in most cases.

If both strong and weak signals must be received there will be some degradation of picture quality if the carrier is raised above the 50% point. This factor should be considered before the carrier is repositioned.

The position of the video carrier on the video i-f response curve may be changed by realigning the sound i-f

stages at a lower frequency. A 400 kc change from 21.75 mc to 21.35 mc, has been found to give the best results. Changes greater than this may produce an objectionable amount of smear.

Since the receiver is tuned for proper sound the shift in the sound i-f results in a shift in the video i-f signal, at the output of the tuner. This positions the video carrier higher on the video i-f response curve.

In changing the sound intermediate frequency follow the alignment procedure given in the Service Notes. Only those steps pertaining to the sound i-f's and the narrow-band sync need be performed. The marker frequencies shown in Figure R-3 should be substituted for those in the Notes. The new narrow-band sync center frequency should be 25.85 mc.

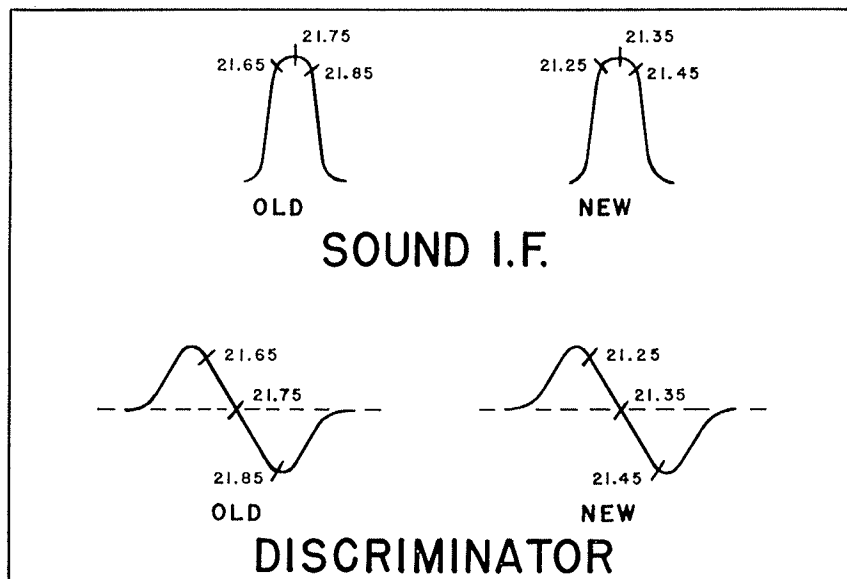


Figure R-3. Old and new alignment curves.

DON'T FORGET THE A.G.C.

The importance of proper a-g-c adjustment is often overlooked in the field. At the factory the a-g-c is adjusted for optimum performance in the average installation. When receiving conditions are unfavorable better results can usually be obtained by re-setting the a-g-c to suit the particular location in which the Teleset is installed. It is for this reason that provision has been made in all Du Mont

Telesets to permit adjustment of the a-g-c in the field. The technician should take advantage of this provision, especially in extremely weak signal, strong signal or noisy areas.

In a strong signal area the Teleset may overload as a result of an a-g-c adjustment which does not permit sufficient a-g-c voltage to be developed.

In weak signal areas excessive a-g-c voltage can cause the picture to lack contrast and can drastically reduce the noise immunity of the Teleset.

In strong signal areas when horizontal pull is encountered try carefully turning the a-g-c adjustment clockwise observing the effects on the picture.

In weak signal areas when insufficient contrast or poor noise immunity are encountered try carefully turning the a-g-c adjustment counter-clockwise.

In many cases the above may be all that is necessary to transform an unsatisfactory installation into a successful one.

Converting Du Mont Input Tuners For 300 Ohm Input

Provisions have been made in all current Du Mont Telesets to permit the use of either 72 or 300 ohm transmission line. However, an antenna connector is provided for 72 ohm line only. In relatively noise-free fringe locations low-loss 300 ohm line will often produce better results than 72 ohm coax. 300 ohm line may be used

by providing a matching transformer, or by bringing the 300 ohm connections of the antenna-input transformer out to terminals at the back of the set. 300 ohm terminals can be added by using the following procedure.

RA-112A, RA-113 and RA-109A

1. Unsolder all leads connecting the tuner to the circuits on the main

chassis and remove the tuner from the main chassis.

2. Remove the tuner bottom cover.

3. Unsolder the center conductor of the coax cable from lead 1 of the antenna input transformer (See Figure C-1).

4. Unsolder the coax cable outer shield from the metal strip (A in

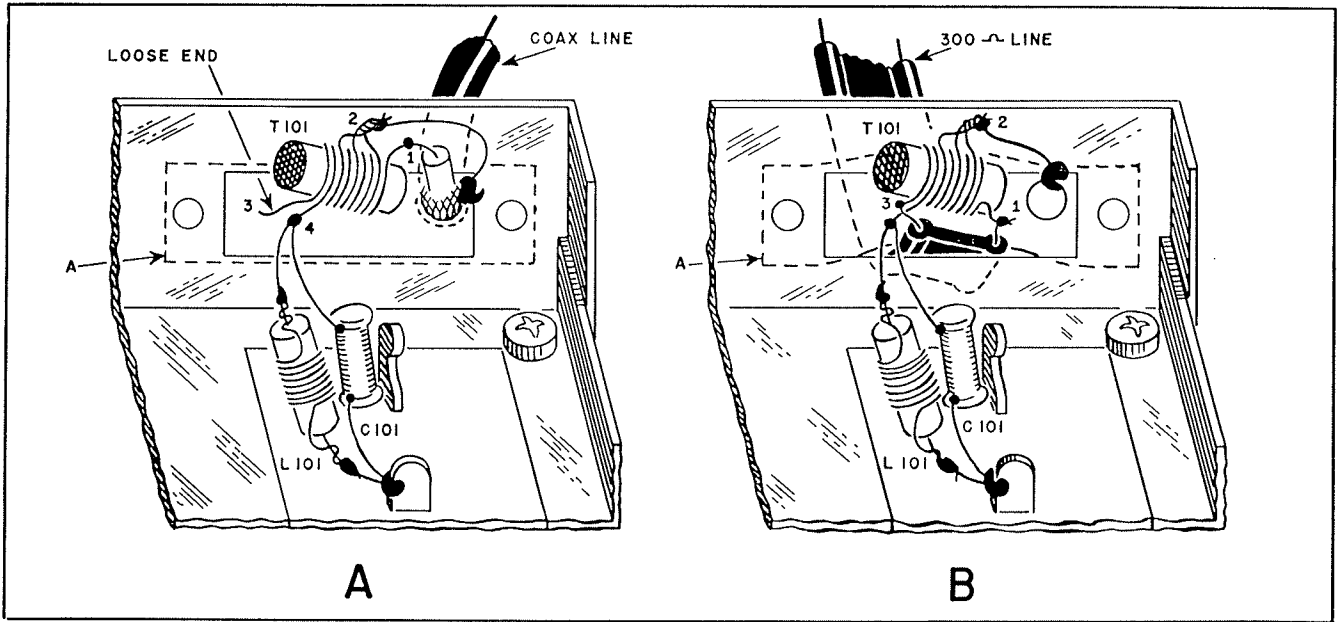


Figure C-1. RA-112, RA-113 and RA-109 tuner parts positioning.

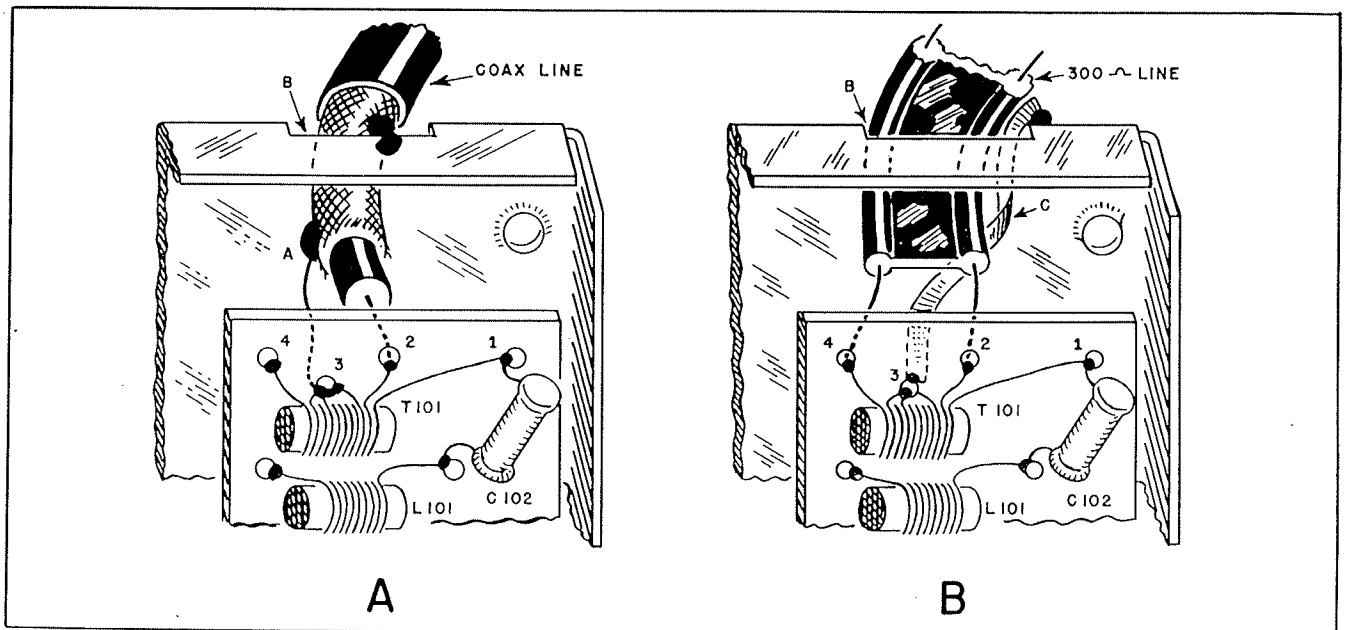


Figure C-2. RA-117 tuner parts positioning.

Figure C-1) riveted to the rear of the Inputuner chassis, and remove the coax cable.

5. Cut a piece of 300 ohm line approximately one inch longer than the coax cable removed from the tuner and strip its ends.

6. Insert a small screwdriver between metal strip A (Figure C-1B) and the rear of the tuner chassis; and insert one end of the 300 ohm line in the opening thus created.

7. Connect the 300 ohm line to leads 1 and 3 of the antenna input transformer as shown in Figure C-1B.

8. Check lead 2 of the antenna input transformer to make certain that it is well grounded to metal strip A.

9. Replace the tuner bottom cover.

10. Reinstall the tuner on the main chassis and reconnect all leads.

RA-117A

1. Unsolder all leads connecting the Inputuner to the main chassis and remove the Inputuner from the main chassis.

2. Remove the tuner bottom cover.

3. Unsolder the center conductor of the coax cable from lead 2 of the

antenna input transformer (see Figure C-2).

4. Unsolder the coax-cable shield from point A on the tuner and remove the coax cable.

5. Cut a length of 300 ohm line, approximately one inch longer than the coax removed from the tuner, and strip its ends.

6. Insert one end of the 300 ohm line through opening B in the tuner chassis.

7. Connect the line to terminals 2 and 4 of the antenna input transformer, as shown in Figure C-2B.

Incandescent Lamp Interference

Some time ago we reported that incandescent lamps can cause television interference. The information appeared on page INS-14 of the Service Notes. The interference produces a horizontal line across the picture as shown in Figure I-1. It is caused by old type B bulbs in which the filament is a single wire, formed in a zig-zag shape and supported by a glass post as shown in Figure I-2.

We recently received a letter from Mr. R. L. Rascoe, of the Bocock-Stroud Company in Winston-Salem, N. C., which added some interesting information to that which appears in the Service Notes.

In his letter Mr. Rascoe says that he has encountered this type of interference on a number of occasions and that it is also caused by certain types

of inside-frosted 15 watt and flame-shaped lamps. The flame type lamp is usually found in wall candelabra while the 15 watt inside frosted type is generally used in hallways or in night lights.

The following are some other things which Mr. Rascoe observed:

1. The interference source is usually within 200 feet of the receiver, although it may be 500 or more feet away in some cases.

2. It may decrease in intensity, and shift in frequency from one channel to another, after the bulb has been operating for a short time.

3. It may appear on several channels, decreasing on some while remaining unchanged on others, as the bulb heats up.

4. It may remain stationary or move vertically through the picture, depending upon the station being received. When the station is nearby and is operating from the same power system it usually remains stationary.

5. Two bulbs may produce interference patterns which are superimposed so that turning one of the offending bulbs on and off will not cause an observable change in the picture.

Mr. Rascoe adds that there may be as many as 30 or 40 bulbs located close enough to a receiver to cause interference. Having nearby neighbors pull their main power switches, while observing the picture, is a simple way to determine whether the offending bulbs are located in the customer's home or in a neighbor's.

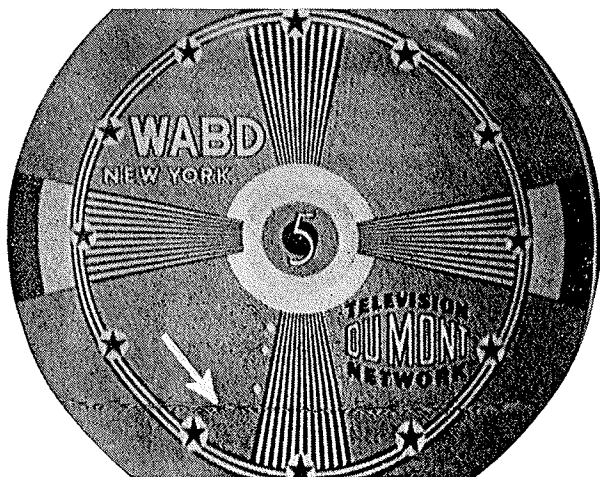


Figure I-1. Test pattern showing interference caused by incandescent lamp.

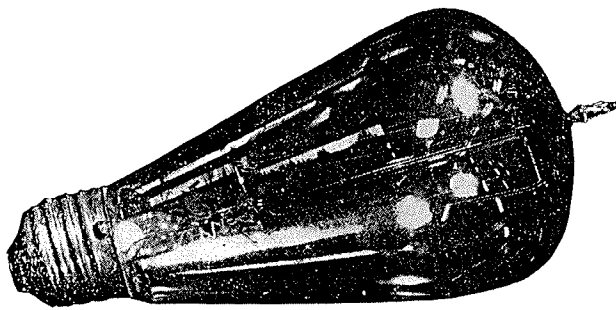


Figure I-2. Old type B bulb, one of the types which produces the interference shown in Figure I-1.

PRODUCTION CHANGES

RA-112A - RA-113 - RA-120

Change No. 53 (ECN-4939)

This change specifies a few alterations in the narrow band amplifier and detector circuits, increasing the sync pulse input to the sync clipper. The result is improved locking of the horizontal and vertical sweep oscillators to the sync pulse in those cases where the station signal is too weak for the sync clipper to deliver its proper output.

A kit for this change, detailed instructions included, will be available from your distributor in the near future. The part number of the kit is 87 000 281, the price: 50 cents.

The first chassis so modified in the plant is: RA-113, serial number 1358054, code AL9.

RA-113

Change No. 54 (ECN-4869)

Reason:

With the substitution of a 6BC5 for the 6AK5 in the Inputuner mixer stage, it has been necessary to change the mixer circuit to maintain the high band sensitivity of the tuner.

Procedure:

1. Remove the old tuner and replace it with the new tuner.
2. Connect the red, black-yellow, and solid yellow leads as before.
3. Remove the lead running from C301 to ground.
4. Connect the tinned side of the twinex lead from the tuner to that side of C301 which was formerly grounded.
5. Connect the bare side of the twinex to the other side of C301.
6. Realign the first video i-f stage.

Parts Required:

PART NUMBER	DESCRIPTION
89 003 915	Inputuner assembly

The first chassis so modified in the plant is: RA-113, serial number 1356435, code AK.

RA-117A

Change No. 22 (ECN-4921)

Reason:

To eliminate inductive feedback, found in some chassis, from the audio amplifiers to the tuner through pickup in the red B+

tuner lead. The resulting variation of voltage on the plate of the local oscillator modulates the oscillator frequency and thereby the sound i-f beat frequency, causing the sound discriminator to deliver the transmitted audio signal plus feedback audio signal, recognized as "motorboating."

Procedure:

Change C303, which is connected between the tie point of the red B+ tuner lead and ground, from .1 mf paper to 10 mf electrolytic.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C303	03 019 410	Cap F E 10 mf 450V

The first chassis so modified in the plant is: RA-117A, serial number 1723060, code 9K.

RA-119A

Change No. 7 (S-33)

Reason:

To prevent possible power supply breakdown.

Procedure:

Change C315 from 600V to 1000V.

Parts Required:

SYMBOL	PART NUMBER	DESCRIPTION
C315	03 015 650	Cap F Pa .05 mf 10% 1000V

The first chassis so modified at the plant is: RA- 119A, serial number 1961.

Change No. 8 (S-41)

This change describes the means of mechanically isolating power transformer T203 by mounting it on rubber grommets, thereby reducing 60 cycle hum transmitted from T203 to the chassis and cabinet.

A kit, including installation instructions, is available from your distributor to modify those Telesets which exhibit this difficulty.

A shipping bracket is incorporated to protect the transformer from excessive shock during shipment. This must be removed when installing the Teleset.

Parts Required:

PART NUMBER	DESCRIPTION
87 000 211	Kit, shock mounting

The first chassis so modified in the plant is: RA-119A, serial number 19317.

PARTS LIST CHANGES

RA-109A — RA-116

RF Tuner

SYMBOL	PART NUMBER	DESCRIPTION
<i>Delete:</i>		
<i>Add:</i>	89 003 013	Inputuner assembly
<i>Add:</i>	89 003 015	Inputuner assembly

RA-112A

Main Chassis

<i>Delete:</i>	L206	21 006 091B	Yoke, Deflection
<i>Add:</i>	L206	21 005 711B	Yoke, deflection

RA-112A — RA-113 — RA-120

Main Chassis

<i>Delete:</i>	C287	03 000 950	Cap Pa .05 mf 200V
	R251	02 032 060	Res F C 270K 1/2W

SYMBOL	PART NUMBER	DESCRIPTION
R284	02 032 480	Res F C 10K 1/2W
R316	02 032 590	Res F C 680K 1/2W

Add:

C239	03 016 730	Cap E 10 mf 25V
C287	03 015 610	Cap Ce 5000 mmf min.
R251	02 032 590	Res F C 680K 1/2W
R253	02 031 980	Res F C 56K 1/2W
R284	02 031 930	Res F C 22K 1/2W
R316	02 032 060	Res F C 270K 1/2W

Add Alternate:

C239	03 014 100	Cap E 10 mf 25V
	03 015 310	
R251	02 042 590	Res F C 680K 1/2W
	02 052 590	
R253	02 041 980	Res F C 56K 1/2W
	02 051 980	
R284	02 041 930	Res F C 22K 1/2W
	02 051 930	
R316	02 042 060	Res F C 270K 1/2W
	02 052 060	

RF Tuner			SYMBOL PART NUMBER DESCRIPTION		
SYMBOL	PART NUMBER	DESCRIPTION	SYMBOL	PART NUMBER	DESCRIPTION
<i>Delete:</i>			C310	03 018 620	Cap Pa .005 mf 600V
	89 003 914	Inputuner assembly	C315	03 015 370	Cap Pa .05 mf 600V
<i>Add:</i>			C316	03 033 180	Cap M 1000 mmf 500V
	89 003 915	Inputuner assembly	C325	03 012 560	Cap F Pa .01 mf 600V
RA-112A — RA-113 — RA-117A — RA-120					
Main Chassis					
<i>Add Alternate:</i>			R302	02 033 640	Res F C 4700 ohm 1W
Z210	20 005 852	Transformer hor. osc.	R304	02 030 760	Res F C 15K 1/2W
	20 005 851		R307	01 006 720	Res V C 2 meg
			R322	02 032 130	Res F C 1 meg 1/2W
			R327	02 126 000	Res F C 500 meg
			T303	20 005 621	Trans, power
				50 002 980	Cable asy, power
<i>Add:</i>					
RA-117A			C301	03 022 010	Cap F M 1K 500V
Main Chassis					
<i>Delete:</i>			C302	03 100 040	Cap F Pa .1 mf 200V
C303	03 100 130	Cap Pa .1 mf 400V	C303	03 022 010	Cap F M 1K 500V
<i>Add:</i>			C306	03 018 290	Cap E 10/10/30 450V
C303	03 019 410	Cap E 10 mf 450V	C310	03 012 560	Cap F Pa .01 mf 600V
<i>Delete Alternate:</i>			C315	03 015 650	Cap Pa .05 mf 1000V
C303	03 014 770	Cap Pa .1 mf 400V	C316	03 022 010	Cap F M 1K 500V
			C325	03 018 620	Cap F Pa .005 mf 600V
			C329	03 012 560	Cap F Pa .01 mf 600V
			C330	03 012 560	Cap F Pa .01 mf 600V
RA-119A					
Main Chassis					
<i>Delete:</i>			R302	02 031 850	Res F C 4700 ohm 1/2W
C606	03 114 201	Cap. assy	R304	02 031 910	Res F C 15K 1/2W
J203	34 002 641	Socket Asy, CRT	R307	01 014 920	Res V C 2 meg 2W
J600	34 002 651	Socket Asy, interconn.	R322	02 032 070	Res F C 330K 1/2W
T604	20 005 840	Trans, filament	R327	02 073 200	Res F C 500 meg
T606	20 005 611	Trans, hor. output	T303	20 005 622	Trans, power
T607	20 005 662	Trans, vert. output		50 074 770	Cable asy, power
<i>Add:</i>			Cabinet		
J203	34 002 642	Socket asy, CRT	<i>Delete:</i>	L402	21 005 343
J600	34 002 652	Socket asy, interconn.			35 011 511
T606	20 005 612	Trans, hor. output			35 011 521
					35 011 531
					35 013 901
					37 002 661
					37 002 671
					41 003 691
					43 001 761
					45 002 671
					64 003 761
					Focus coil asy
					Plate, CRT rear mtg.
					Support strap
					Mtg, deflection coil
					Spacer, CRT clamp
					Clamp, CRT lower
					Clamp, CRT upper
					Sleeve, insulating
					Spacer, CRT clamp
					Window, safety glass
					Mask, 30" CRT

A REVIEW OF FRINGE AREA INSTALLATION PROBLEMS

WHILE THERE IS no simple formula for obtaining optimum results in fringe area installations, a thorough knowledge of the factors involved will enable the technician to solve fringe reception problems as they are encountered.

The purpose of this article is to review some of the problems encountered when installing Du Mont Tele-sets in weak signal locations.

ANTENNAS

Experience with a large number of fringe installations in all parts of the country indicates that the following antennas give the best results. They are listed in order of preference.

1. Rhombic — The Rhombic will generally give the best results. Un-

fortunately its size has limited its use to locations where plenty of space is available.

2. Yagi — Excellent results can be obtained by using a stacked Yagi antenna. Because of its high selectivity the stacked Yagi is suitable for one channel only. If two or three channels must be received, a separate antenna and transmission line is required for each channel. While this arrangement is bulky and somewhat expensive it does permit orientation of each antenna for optimum pickup.

3. Du Mont Fan — A four-bay stacked Du Mont Fan antenna provides excellent gain and will cover all channels. When several stations are to be received from different directions, a rotator must be used so that the an-

tenna may be oriented properly for each station.

Very often optimum results will be obtained by using more than one type of antenna in an installation where several stations are received. A typical case is a location where two or three channels are received fairly well, while one channel is quite weak. A Du Mont fan antenna could be provided for reception of the stronger signals and a Rhombic or stacked Yagi used for the weak channel.

In fringe areas the height and location of the antenna are extremely important. Before final installation of the antenna all possible antenna locations should be explored, to determine which one will give the best results. In addition the antenna should

be raised and lowered to find the optimum height. Keep in mind the fact that the highest point does not always produce the strongest signal. There have been many instances in which an antenna located a few feet above the ground, produced a stronger signal than the same antenna mounted 30 to 40 feet above the ground.

Trees are often disregarded when an installation is made, particularly when they are without leaves. This is a mistake since foliage can seriously affect reception when it is located in the path of the signal. Occasionally cases are encountered in which an installation gives excellent reception in the fall and winter, only to become poor in the spring. The technician is sometimes mystified because the installation has not been changed and all equipment checks properly. Tree foliage is probably the cause. It is best to play safe when making an installation in the fall or winter and keep the antenna well clear of trees.

TRANSMISSION LINES

The use of a low loss transmission line should be considered when making a fringe installation. The transmission line is especially important when the antenna must be located a considerable distance from the receiver.

The signal attenuations per hundred feet of the various types of transmission line are shown in table 1. Note that at the higher frequencies the attenuations of all types of line are greater. Consequently the type of line used is more important in areas where high channel stations are received.

The following is a summary of the factors to be considered in choosing a transmission line.

1. If the length of line required is less than 50 feet, and only low channel stations are to be received, the difference in attenuation between RG-11/U and 300 ohm twin lead is not great enough to warrant sacrificing the shielding characteristics of the coax.

2. If the length of line required is greater than 50 feet, or high channel stations are to be received, 300 ohm line will give a worthwhile increase in signal over coax.

3. If the location is particularly noisy, coax may give superior results,

even though the line is quite long.

When 300 ohm line is used a matching transformer should be connected between the input of the receiver and the line; or the tuner should be rewired so that the line may be connected to the 300 ohm terminals of the antenna input transformer. Instructions for rewiring the tuner for 300 ohm input will be found elsewhere in this issue. Although a matching transformer will minimize standing waves, the attenuation which results from its insertion is often great enough to warrant rewiring the tuner input. If a matching transformer is used in an extremely weak signal area it is advisable to try several transformers and select the one which gives the least attenuation.

The receiver should present a resistive load to the line; however it is usually reactive on one or more channels. When 300 ohm twin lead is used reception of the channels on which the input of the receiver is reactive can be improved by tuning out the reactance. The match can be checked by sliding your hand along the line while watching the picture. If there is a variation in signal as you move your hand along the line, the load is reactive on the channel to which the receiver is tuned. To remedy this condition run your hand along the line to locate the point which produces the strongest signal and connect a ceramic trimmer (10 mmf) across the line at this point. The trimmer should then be adjusted for maximum signal.

Another method of tuning out the reactance which gives excellent results consists of wrapping a length of metal foil around the line and sliding it along the line until the best picture is secured. Pieces of foil 3 inches and 6 inches long should be tried to determine which size gives the best results.

Before connecting the twin lead permanently to the receiver, the connections should be reversed to determine

TABLE 1
Attenuation db/100 feet

Frequency (mc)	300 ohm		RG-11/U	RG-59/U
	large	small		
60	.76	.93	1.37	2.75
80	.89	1.10	1.62	3.25
100	1.24	1.52	2.44	4.55
144	1.48	1.82	2.85	5.50

whether or not one method of connection will give a better signal than the other.

When installing the transmission line keep it as far as possible away from noise producing equipment. The outer shield of coaxial cable should be grounded every 10 feet if possible.

300 ohm line should not be run near copper gutter, water pipes or other conductors. Running the line near such a conductor may result in considerable loss of signal. When two or more antennas with separate transmission lines are used, the lines should be run a few feet apart to prevent the signal on one line from cancelling the signal on the other line.

If a booster is used, one which has a high signal-to-noise ratio should be selected. Signal-to-noise ratio is generally more important than gain.

Fringe area antenna installations are of necessity more elaborate than those in strong signal areas. When a tower-mounted antenna is used, an antenna service call may consume the time of two men for a half day or longer. Consequently strong well-mounted towers, equipped with rust-resistant hardware, should be used. Effort spent in making the initial installation as sturdy and weather-resistant as possible will be well repaid in time, money and customer satisfaction.

SYNC MODIFICATION KIT

A new composite sync modification kit is being made available through your Du Mont Distributor. The kit is intended for use with RA-109A, RA-112A and RA-113 Telesets.

The purpose of the kit is to improve the operation of the Teleset in both strong and weak signal areas. Its installation increases picture stability under weak signal conditions and eliminates horizontal pull under strong signal conditions.

The part number of the kit is 87 000 281 and its price is 50 cents.

TROUBLESHOOTING HINTS

Teleset: RA-105B and RA-108A

Symptom: Horizontal wiggle at the top of the picture.

Probable Fault: The value of C312, the 82 mmf capacitor connected from the plate to the grid of the vertical buffer, has changed.

Remedy: Replace C312.

Teleset: RA-109A, RA-112A, RA-113, RA-116, RA-117, RA-119

Symptom: Sound drift.

Probable Fault: An open capacitor in one of the sound i-f transformers (Z201 in RA-112A, RA-113 and RA-117, Z201 or Z202 in RA-109A, RA-116A and RA-119). Two capacitors are mounted in the bottom of each of these transformers. The capacitors consist of a small sheet of mica which acts as the dielectric of both capacitors, with silver coatings on both sides forming the plates as shown in figure T-1. The transformer terminals are cemented to these plates. Humidity or vibration can cause a terminal to separate from its associated plate and open the capacitor. During alignment the stage will show low gain and the transformer will not peak at the sound intermediate frequency.

Remedy: Replace the transformer. Realign the sound i-f strip if necessary.

Teleset: All equipped with phonographs

Symptom: Poor record tone, needle scratch.

Probable Fault: Wrong type of pickup cartridge in phonograph arm.

Remedy: Replace cartridge with proper type or change the pickup compensating network.

Teleset: All

Symptom: Dirty CRT face.

Probable Fault: Poor dust seal between CRT face and mask.

Remedy: Locate the opening in the seal and cement a strip of $\frac{1}{4}$ " felt to the mask at the proper point, to provide a tight seal. Speaker cone

cement may be used. The dust will usually be thickest in the vicinity of the opening in the seal.

Teleset: Early Production RA-109A, RA-112A, RA-113 and RA-117

Symptom: Low sensitivity and noise in the picture.

Probable Fault: Leaky coupling capacitor in video i-f transformer. This occurs in transformers in which the wire forming one plate of the coupling capacitor is uncoated.

Remedy: Replace the transformer with type having coated capacitor wire or remove capacitor wire and connect a 1.5 mmf ceramic capacitor across the upper ends of the transformer windings.

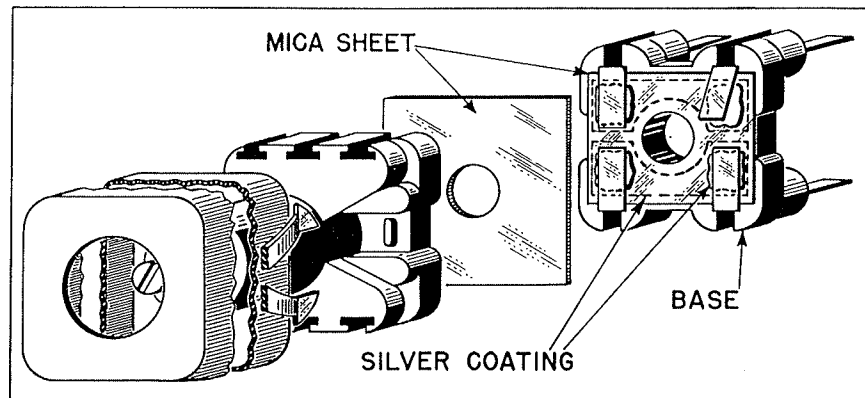


Figure T-1

DIRECTOR'S CORNER—(Cont'd)

Thousands of people and hundreds of thousands of components are involved. With all this activity, it is only with great determination and vigilance on the part of our entire staff, from top management to the line assembler, that gremlins are kept off the production line. Our basic production policy sets as our standard a product of the highest quality and least service trouble.

A realistic appraisal of the Du Mont Telesets you service will prove what we know to be true: With the men who have been in the service business longest, it's Du Mont as the favorite.

Line Voltage vs Sensitivity

Line voltage is an important factor affecting television reception in fringe areas. Tests show that with a 50 micro-volt signal applied to the input of a receiver, the sensitivity decreases noticeably when the line voltage drops below 95 volts.

The sensitivity of a television receiver, designed to operate at 110 volts a.c., and not equipped with a line voltage regulating device, may drop as much as 50% when the line voltage is reduced to 95 volts.

Other effects of low line voltage are insufficient brightness, reduction of

overall focus, and insufficient vertical and horizontal size.

When making a fringe installation always check the line voltage. The voltage is usually higher in the morning and afternoon than it is during the evening when the peak power demand occurs. If the customer complains of loss of sensitivity and size during the evening, the line voltage is probably at fault. In this case the voltage should be checked during the peak demand period.

The voltage at the Teleset may be returned to normal by using a step-up transformer or Variac.