The R. & T. Videophone

Ricardo Munitz, E.E.,* and S. Morton Decker,**

This extremely flexible unit can be used as:

- Two-Way Television Telephone
- One-Way Television Telephone
- Modulator Unit in Amateur Radio Television
- Television Service Engineer's Video Signal Generator
- Television Camera for Demonstrations
- Classroom Demonstration Unit

The design is such that either camera can be used with either monitor. When the nearer monitor is plugged into its camera it is possible to make camera adjustments.

The tentative amateur television standard was adopted. This is 120 lines per picture, 20 pictures per second. This was done with the use of the unit as a modulator for amateur television, later, in mind. The 120 lines
The camera unit containing the power supply for the complete television telephone system, also contains the video amplifiers, which must follow its line, a blanking and synchronizing impulse tube and the sweep (saw-tooth) oscillators. The other camera in this set-up contains the line and its video. The controls provided on the front of this camera are: Horizontal Sweep Frequency (number of lines per second); Vertical Sweep Frequency (number of frames per second); Focus and Beam Current of the line; Gain of the Video Amplifier (picture contrast); and blanking level control.

On the monitors, which contain only the cathode-ray viewing tube and its bleeder (besides the plug), are mounted the focus and brilliance controls of the picture-viewing tube, and a jack for a pair of phones (when apparatus is used as a one-way television phonograph). On the camera mount is a pair of jacks, one for mike and one for phones (phone jack used for two-way videophone operation). The other camera contains only the line and its video amplifiers, a filament transformer, focus and beam current controls for the line, and a video gain control.

When used as a unit independently is foremost in the mind of the constructor, and the unit is intended to build only one camera and monitor (for either one-way television phonograph OR as modulator for ham use) the unit will contain the following: incline camera: power-supply for camera and monitor (the complete, this includes a high voltage supply for the line and the C-R tube and a low voltage one for the video amplifiers and the sweep oscillators. The camera will also contain the bleeder for the line, the video amplifiers, the sweep oscillators, the blanking and synchronizing tube, the six controls mentioned above and the line. The monitor will contain a bleeder, plug, jack, and the two controls for the viewing tube. The camera of course has the view jack and the plug for the cable going to the monitor.

The photographs which accompany this article show the BIG camera and one of the monitors. This is the camera designed for two-way videophone operation and containing the larger power-supply. Note the relatively small size of the unit, also the bare simplicity of the monitor unit. In this two-way unit the other camera will be very empty; the other monitor just like the one shown.

We are accompanying this write-up with a full chassis drilling layout and with all mechanical construction details. The sketches will enable the ambitious constructor to get started without any delay. By the time this next article appears he can be ready to mount parts and wire the unit he has elected to construct.

In the meantime final tests and improvements are being made on the videophone units in the laboratories of the Television Club at the Brooklyn Technical High School to assure the constructor that he is going to have a completely "de-rigged" outfit which will work well—first crack!

At the present moment we are employing five video amplifier stages—four using 6AC7 tubes and one a 6AG7. We are endeavoring to improve the unit, without increasing the response of the video, in an effort to do with three stages in place of five. Five are a little fuzzy to keep side and without tendency to oscillate. However, they prove absolutely necessary, following our plans will assure good results.

We have endeavored to build the camera unit upon the smallest possible chassis, so that it may not be clumsy and so that it can later be mounted upon a regular heavy wooden camera tripod for outdoor use. The experiment may therefore employ a larger chassis. In this case it is suggested that the space between the power-supply and the rest of the unit be increased and that additional separation be provided between the sweep oscillators and the video. This arrangement will require less careful routing of wiring in the unit. With care in routing leads, it is not necessary to make the unit any larger than we have. Naturally the experiment will so route his wires as to avoid tentative feedback in the video; hum pickup by wiring of the low-level stages, etc. The specific precautions will be listed in the next article. By the way, a suggested change which would make the camera lighter would be to build its power-supply as a separate unit, and to put a cable between the camera and the power-supply.

The authors felt, however, that better a heavy camera in one unit, than to have to "portage" two units.

The drilling dimensions given correspond to the parts used by the authors. These parts will be listed completely in the coming article, so the constructor will be able to get exactly the same parts to fit his drilling.

The picture is about the resolution limit possible with the Ham Eye.

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