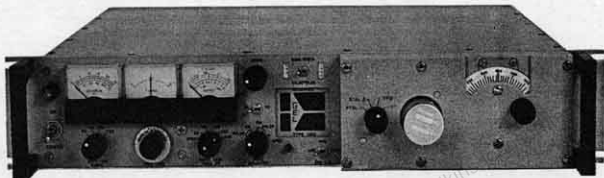


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**MODULAR** **solid state****TELEMETRY RECEIVER**  
**Type 11S2**

The GEL type 11S2 solid-state telemetry receiver provides the quality reception typical of the latest vacuum tube telemetry receivers while having all of the size, weight, and power conveniences of a solid state receiver. Complete versatility is another important characteristic of the 11S2 receiver. This receiver has been designed to accept tuners for any of the popular frequency bands and to provide for all of the normally used signal processing functions on either a built-in or plug-in basis.

The 11S2 receiver is designed to receive all normal IRIG data formats, and accepts any one of the RF tuners listed in Table I without modification. The tuners, which plug into a front-panel receptacle, all provide excellent preselection and linearity ahead of the first mixer.

Local oscillator radiation has been reduced to a minimum. The first local oscillator in each tuner is capable of either crystal control or VFO operation with either mode of operation selectable from the front panel.

Being of the double superheterodyne design, the receiver employs a 2nd IF frequency of 10 mc. The oscillator used for this down conversion is tunable over the range of  $\pm 150$  kc for vernier tuning purposes. The output of the second mixer feeds either one of two plug-in units which determines the IF bandwidth characteristics. The choice of filter is made by means of a front panel switch. As dictated by equipment usage, a wide variety of bandwidths may be plugged into the unit. Table II shows the standard available filter units. Xtal and other filters are

available also. The output from the selected filter then feeds an IF amplifier and subsequent limiter-discriminator.

The limiter-discriminator used in this receiver is designed to exhibit excellent capture characteristics and extreme linearity. A wide band video amplifier provides gain to the output of the AM or FM demodulator.

Amplifier AFC and AGC is provided in the 11S2 to give stable operation under varied conditions of signal strength, transmitter stability, doppler, etc.

The receiver has full facilities for internally plugging in phase-lock demodulators, carrier-lock PM demodulator, and predetection record and playback converters. These plug-in modules are available as extra options and may be included at time of purchase or added later as needed without receiver modification.

Auxiliary circuitry in the receiver includes a second video amplifier capable of operation from either the AM detector output or the FM output with a DC to 250 kc response.

Mechanically, the 11S2 receiver is housed behind a 3-1/2 inch relay rack panel with an overall depth, exclusive of mating connectors, of 12 inches. Mechanical packaging has been designed to allow maximum versatility by substitution of modules and features excellent RF shielding to insure proper operation in adverse environments.

## SPECIFICATIONS

Table I. R.F. Tuners for the 11S2 Receiver

Model No.	Characteristics	Noise Figure
11S2-H1	90 - 260 mc VFO only	6.5 db
11S2-H2	120 - 150 mc Xtal or VFO	6.0 db
11S2-H3	200 - 265 mc Xtal or VFO	6.5 db
11S2-H4	165 - 265 mc Xtal or VFO	6.3 db
11S2-H5	300 - 410 mc Xtal or VFO	8.5 db
11S2-H6	900 - 960 mc Xtal or VFO	9.5 db
11S2-H7	1435 - 1535 mc Xtal or VFO	9.5 db
11S2-H8	1700 - 1800 mc Xtal or VFO	10.5 db
11S2-H9	2150 - 2350 mc Xtal or VFO	10.5 db

- TYPE OF RECEIVER** Double superheterodyne
- FREQUENCY RANGE** Determined by RF tuner installed in front panel receptacle
- INPUT IMPEDANCE** Operates from 50 ohm source
- FIRST LOCAL OSCILLATOR** VFO and crystal selectable from front panel. VFO stability approximately  $\pm 0.001\%$ /degree C. Crystal  $\pm 0.005\%$ .
- LOCAL OSCILLATOR RADIATION** Less than 50  $\mu$ v across 50 ohms at antenna terminal
- IF CENTER FREQUENCY** First IF, 30 mc; Second IF, 10 mc
- SECOND LOCAL OSCILLATOR** VFO tunable from front panel  $\pm 150$  kc
- IMAGE REJECTION** 60 db minimum
- IF REJECTION** 80 db
- IF BANDWIDTH** Receiver furnished with customer choice of two selected from Table II. Units are plug-in filter modules. Bandwidth in use selected by front panel switch - special filters may be obtained also.
- OVERALL SELECTIVITY** 60/6 db ration approximately 2.5 to 1 with standard filters

- DISCRIMINATOR** The 11S2 supplied with a wide band plug-in discriminator module. Linearity (best straight line)  $\pm 1\%$  over band  $\pm 650$  kc. Other modules such as a crystal discriminator may be substituted.
- VIDEO AMPLIFIER (HIGH LEVEL)** Frequency response 3 cps to 2.5 mc within  $\pm 3$  db, capable of 10 v p-p into 50 ohm load. Amplifier distortion less than 0.5%. The amplifier operates from AM detector or FM demodulator by front panel selection.
- VIDEO AMPLIFIER (LOW LEVEL)** AM, DC to 250 kc  $\pm 3$  db with 10K ohm load. Output - 4 v p-p. FM, DC to 250 kc  $\pm 3$  db. Output - 4 v p-p.
- VIDEO ROLL-OFF (HIGH LEVEL)** 20 kc, 50 kc, 100 kc, 300 kc, 500 kc, at 12 db/octave with provision for plugging in special filter to meet other requirements. Selection is made from the front panel.
- AGC** AGC is available in two modes; Normal (average reading); Pulse (peak reading). Time constant is changeable internally by plug-in timing capacitor.
- AFC** AFC is available in two modes; Normal (average reading for FM/FM etc.); Pulse (average of peak-to-peak for PCM/FM etc.). Selection is made from the front panel. The tuning meter reading is also switched to be consistent with the AFC mode being used.
- METERING** Tuning meter. Deviation meter - 25 kc, 75 kc, 250 kc, 750 kc, full scale, response 50 cps to 500 kc. Signal level meter - calibrated in microvolts of received signal (approximate). VU meter with adjustable reference for video output measurement.
- OUTPUTS** a) AM, FM video high level; b) AM, FM low level; c) 10 mc preselection output; d) FDU output, 30 mc.
- POWER** 117 v, 50 - 400 cps, 18 watts
- SIZE** Standard relay rack construction - 3-1/2 inch panel x 19 inches - 12 inches overall depth exclusive of mating connectors
- CONNECTORS** RF input Type C. All others BNC or TNC per customer choice.

Table II. Standard IF Bandwidths

GEL Part No.	Bandwidth
11S2-F1	30 kc
11S2-F2	50 kc
11S2-F3	100 kc
11S2-F4	300 kc
11S2-F5	500 kc
11S2-F6	750 kc
11S2-F7	1 mc
11S2-F8	1.5 mc

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



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