



# Level Control Equipment

## Outline and General Information

AUDIO DESIGN RECORDING specialise in the development and production of audio processors in the form of Limiters, Compressors, Expanders, Equalisers and other specialised audio facilities. The current range offers a wide choice to the engineer and is likely to meet most requirements in the audio field. Equipment of our design is widely used by leading studios throughout the world, and has acquired a reputation for performance and reliability second to none. Units are designed to the highest technical standards having low noise and distortion, with good overload margins; they are well constructed and can be relied upon to function unobtrusively with minimal attention.

**F760X COMPEX—LIMITER** series in its stereo format is currently the leading product of our range; being a Peak Level Limiter—Compressor—Expander combination unit of superb design making operation quite straight forward. The Peak Level Limiter operates over a multi-ratio variable threshold Compressor, and can be set to provide peak level output levels of +14dBm and below. An Expander—Gate operates below the Compressor section with optional slopes of 1:2 and 1:20. Any of the three functions can be used by themselves or in any combination. This sophisticated package offers really excellent value in this field.

**F700 COMPRESSOR—LIMITER** series offers a slightly simpler approach to threshold selection, by switching threshold with ratio, so that for approximately 10dB of gain reduction the output levels remains constant as the ratios are changed. It is only necessary to increase the input pot to determine the amount of compression and adjust the output level to suit the following equipment. The unit is available with the Expander—Gate option.

**F600 LIMITER** series has always found favour as a studio and transmitter limiter; it was recently re-designed and updated to provide improved specification with regard to noise and distortion. Superb transient performance and freedom from any instability.

**F690 VOICE—OVER LIMITER** or 'Music—Voice Ratio Control' is a standard F600 limiter with a voice-operated threshold. Ideal for self-op desks, the unit will automatically maintain a pre-determined relationship between voice and music. Should the operator fail to fade as he speaks, the unit functions to attenuate the music level by just the required degree, thus creating a 'voice-over' effect; on the other hand if the music level has dropped or been faded sufficiently no further attenuation takes place.

**E900 SWEEP EQUALISER** is a 'parametric' type equaliser having four continuously variable sweep controls covering a wide range and providing simple yet incredibly flexible selection facilities in accentuating or attenuating specific areas of the audio bandwidth. The unit has a 40dB control range and is ideal for instrumental and vocal use. Each pair of frequency sweep controls covers the whole bandwidth, once at a Q of 3 and at a Q of 1.5. A 'peak-off-dip' switch on each section enables the user to preselect an amplitude on any section and switch to peak or dip for a momentary effect plus any EQ going on in other sections.

**F769X-R VOCAL-STRESSER** combines the E900 Sweep Equaliser with the F760X Compex-Limiter in a unique audio package that has found an enthusiastic reception among so many balance engineers. The equaliser can be routed 'before (PRE); after (POST) or into the side-chain of the compressor section (S.C.) where it is possible to establish one's own particular frequency conscious side-chain. An alternative input and output are provided so that the equaliser can be used to process a different signal when not in use with the F760X section. The name 'Vocal-Stresser' was coined since the package proved so successful in handling difficult vocals; it is of course ideally suited to all instrumental work.

**E500-RS BANDSELECTION PROCESSOR** another ADR unique product enabling any portion of the audio bandwidth to be separated and routed externally for processing (i. e limiting, compression or expansion) and effects use. The processed signal when returned and added back makes up the full bandwidth again and is completely flat and without phase-shift under unity gain conditions. Where the selected region is attenuated or amplified, the result is a static equaliser; when gain is changed momentarily by limiting or expansion, the result is dynamic equalisation. With a limiter the shelving or notching appears momentarily above a certain level; using an expander the effects appear a low level, below the threshold level. Above the expander threshold the frequency response is flat again; whilst the same holds true below the limiter threshold. Thus heavy LF modulation can be limited without modulating the remaining signal content; rumble can be attenuated at low level yet returning to a flat LF response when signal is present to mask it.

**E560 SELECTIVE LIMITER-DYNAMIC EQUALISER** combines the F600 limiter with the parametric notch filter of the E500. The limiter can function on overall programme content; as a selective limiter operating on the notch content only, or as a full parametric equaliser with 20dB lift and in excess of 30dB attenuation; Q continuously variable from 0.3-10 with centre frequency from 20Hz-20kHz. Ideal for de-essing etc.

**F300 EXPANDER-GATE** has been primarily designed as an aid for multi-track mix-down. Careful attention has been given to ensure simplicity of operation whilst retaining full flexibility for effects use. In the 'auto' mode the signal is swiftly, yet smoothly attenuated as the signal ceases to provide a useful contribution to the mix; the channel opening with a clean instantaneous response as necessary. This degree of automation relieves the operator of the arduous task of closing channels to avoid undue ambience, cross-mic pickup and accumulative tape noise. Up to seventeen channels can be supplied in a rack mounting assembly as per the **SCAMP** system outlined below.

**SCAMP**

**The Standardised Compatible Audio Modular Package** system is a dynamic response to meet the requirements of broadcast and studio engineers for the 'latest' idea in an era of rapid technological innovation.

The rack assembly accepts up to seventeen 1" modules and is supplied from a beefy power-pack. Modules operate on a 48 volt rail and are individually stabilised. Inputs and outputs are electronically balanced. The system is designed for wiring to a studio patch-field with provision on the comprehensive 'mother' board for internal routing between modules.

A whole range of modules are in the course of production for this system including Limiters, compressors, expanders, equalisers, mic pre-amps, mixer channels, a reverberation system, high and low-pass programme controlled noise filters, effects modules and LED column indicators that can be arranged with a control module to provide octave or third-octave displays. (see the **SCAMP** system brochure)

**STEREO OPERATION:** Stereo rack-mounting units (-RS) provide both ganged and independent attenuators on inputs and outputs (excepting E500); they can be used as separate mono units, or for processing a stereo signal. With Limiter-Compressor Expander units the closed-loop tracking of both control elements are closely matched along with the slope and threshold, to avoid image shift under dynamic conditions. A link switch effects stereo or mono operation as required. Peak Level Limiter sections are not linked since they should be operating on transients only.

Whilst unmatched Limiter-Compressor modules can be linked for stereo operation, the range of use may only be some 10dB before tracking error is apparent. Special matching is recommended for guaranteed performance over a control range of 20dB.

**ALL UNITS** are designed for operation at normal line levels (with the exception of some specialised **SCAMP** modules). A system by-pass switch enables a direct comparison to be made between the original signal and the equaliser/compressed/expanded signal, peaking to the same level. On compressors and limiters, useful gain is incorporated so that compression can be effected on normal line levels without loss or the need of make-up gain in following stages. Compressors can be used in situations where signal level is as low as -20dBm, but this would only provide about 5dB compression or limiting. Ideally, the signal should be peaking at least to -10dBm (to give 15dBm compression). In practice this covers the majority of contemporary mixer systems when inserting into a channel. The output from the units can then be attenuated as required to suit the following equipment.

**FORMATS:** Units are available in three primary formats. As mono rack-mounting mains powered, suffix (-R); as stereo mains powered rack-mounting, suffix (-RS); or in a mono 80 x 190mm module, suffix (-N). There is also the special **SCAMP** system of card-modules.

**RACK-MOUNTING UNITS** are indicated by the suffix -R after the series number for mono; and -RS for stereo. The current series of rack systems are 3½" high with a depth of 8½" (excluding connectors). This applies to all units with the exception of the P400 and E500-RS which are 5¼" high. Audio connectors are XLR 3-pin and provision is made to internally fit input/output transformers as an optional extra should balanced or floating systems be required. Power requirements are for AC 220-240v or 110-120v; supplied with IEC mains plug and socket.

**TYPE 'N' MODULES** are 80 x 190 x 110mm in depth. Connectors are rear mounting 16-way Blue Ribbon/Red Range P & S. Power required in +24v stabilised at approximately 120 mA. Input and outputs are unbalanced; should balanced/floating termination be necessary it is best to mount transformers on the desk sub-plate along with the chassis mounted connector socket.

**TRANSFORMER OPTIONS:** When ordering transformers the model reference number should be followed by '/T' (i. e. F760X-RS/T). On the F769X-R 'Vocal-Stresser', four sets of transformers are required to cover the additional equaliser input and output. On the E500-RS it is only possible to fit transformers to the main system inputs and outputs; the 'send' and 'return' facilities are unbalanced and shortage of space precludes the fitting of transformers.

**CUSTOM DESIGNS & FORMATS:** We shall be pleased to quote for the production of units in special or discontinued formats. Our design and development company CRANBOURNE ASSOCIATES can offer expertise in analogue, digital and video tech.

**WARRANTY:** Audio Design Recording products will be repaired free of charge (labour & materials) for a period of one year from the time of sale.

AUDIO DESIGN RECORDING  
F760-R LINEAR-COMPRESSOR

ON  
OFF

AUDIO DESIGN RECORDING  
STEREO LIMITER-COMPRESSOR

ON  
OFF

AUDIO DESIGN RECORDING  
COMPRESSOR-LIMITER

ON  
OFF

# F600 Broadcast Limiter

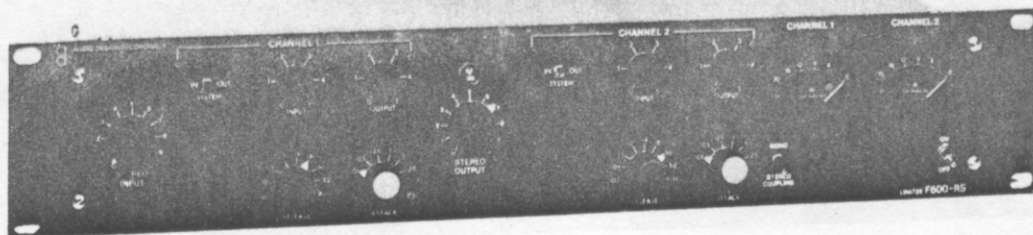
The **F600 Broadcast Limiter** has proven to be a most successful design concept, having evolved originally from our diode-bridge device of 1965 being improved in various aspects of its performance over the course of time. Its most important attribute has always been the dynamic characteristics; the smoothness of its operation in handling initial transients is unsurpassed.

Ideal for use in systems that have critical overload conditions such as optical film recording, disc-cutting and RF transmitters, the overshoot is so minimal that it can safely be worked to within 2dB of the overload level. Such a unit will also prove invaluable for use in high level sound reinforcement systems to prevent ampli-

fier clipping, thus providing speaker protection.

Simple to operate and unobtrusive in use, the **F600 Broadcast Limiter** provides attack and release characteristics of **10 $\mu$ S - 2.5mS** and **25mS - 3.2 secs** respectively. Variable input and output attenuators adjust the threshold of operation from -16 to +16dBm; gain reduction being indicated on the specially calibrated meter.

Used extensively in **BBC Local Radio** and by companies such as **Marconi, EMI** and **Link Electronics** for their transmitter installations throughout the world; the **F600** is a prime example of how well proven designs give uncompromising performance - at sensible prices!



# F690 Voice-Over Limiter

The **F690** is more than a **Voice-Over Limiter** it automatically maintains a pre-determined correct *music-voice balance* at the output of the desk.

Unlike the common practice of using the control voltage of one limiter to duck another on the music channel (the amount of attenuation is unpredictable and often excessive being dependent on the level of the announcer's voice); the **F690 attenuates the music by only the amount it exceeds a lower pre-established threshold**. If the music has already fallen below that level

no further attenuation will be necessary since an adequate music-voice ratio already exists - none takes place! Thus if the operator fails to properly fade the music channel, the **voice-over** effect will occur automatically in order to maintain intelligibility.

The unit offers all the facilities of the basic **F600 Broadcast Limiter** plus **Voice-Over** which may be restricted to one channel for mono operation, leaving the second channel free for insertion in the announcer's microphone chain.

