Okay, so we need a single autoharp that allows playing open notes on pure diatonic scales, one that plays fully chromatic, at least in the universal key of C; and one that has a bigger, cleaner sound than a standard chromatic.

Our instrument is the CGD + E7 decatonic, 15 bar, 12 chord, 3 lockbars.

This provides the key of C with F,C,G7,D7, A, E7, Dm, Am, Em and even allows a harmonic (chromatic) minor of Am (Am, Dm, E7). It plays diatonic tunes in a normal way in G or D, lockbars for both. G includes a II7 (V of V) chord of A7. D has no F#m (iii) but is "the power key" due to the most doubled strings (Ds and As). The actual balance among keys is quite good.

The chords are F, C, G, D, A, G7, D7, E7, Dm, Am, Em, Bm. The A Major subs as A7, so that the instrument can play a basic key of A (A, D, E7).

This is an autoharp, so a compromise or two will be expected. Among the notable compromises is that there will be no I7 chord in one of the keys that is otherwise the most "chromatic" (C), which would add one more note to the requirements for the sake of one color chord (C7), one which will be missed but not a deal breaker. Otherwise, one is obviously stuck with a full chromatic, although a five key (adding F), 11 note instrument has been done and would work, depending on the goals for it.

Note that for generations the Oscar Schmidt model 73, 12 chord had D# strings that none of the chords used. It was essentially this same 11 note octave instrument idea without actually capitalizing on it.

Another compromise is that the number of keys and associated chords is limited. The advantage to that is the instrument is free of the loudest, most troublesome harmonics, as additional chords get crowded onto the instrument.

Lastly, the end key (D) will not have a iii chord (F#m) for lack of space.

So, the key on one end lacks a I7 and the key on the other end lacks a iii. The key in the middle (G) does not have the chromatic range (no III) but has the most doubled strings (G and D), potentially the key with the fattest sound.

The tuning is standard except for D# and A# notes tuned down a half step to form doubled notes with D and A respectively. This is not far off standard chromatic but has a significantly better ratio of open strings per chord. The playing experience is more satisfying.

The chord bar set is a custom 15 bar, three button row, with three lockbars. However, one can start with or even settle for using 15 positions of a 21 chord set or filling out the other 6 positions with various "spice" chords (leaving the essentials within the first 15 and to the right of the 1/3 node harmonic line in the bass strings).

A factory OS 15 bar would not suffice, because the wider bars take up too much room, there are only two button rows, and because the bar set itself is unworthy of a serious instrument. An older ChromAharp, russet colored 15 bar set is better quality but still not suitable in my opinion.

The lockbars have regular buttons and are positioned to allow holding the button down with the thumb while fingering other chords. This allows key modulations and allows any II7 or III7 chord to be complete with its out-of-scale notes. For example, the key of C can be diatonic until you get to a call for a D7 or E7, even A7 (A) chord. You lift your thumb off the lockbar and suddenly play as if a chromatic.

The chord layout I use, actually transposed from my GDA +B7, is as follows:

CLk		GLk		G7		D7		DLk	
	F		C		G		D		A
	Dm		Am		Em		Bm		E7

So that's it. You are ready to go for either a chromatic workshop, certainly in C, possibly in G, or a diatonic workshop in C or G and all but F#m in D. You have lockbars, so for a session on open notes or for jamming later, you are all set. What you don't get is a break on needing to hit the right strings.

Addendum

The string schedule is standard factory chromatic except two D#s are tuned down to D, and three A#s are tuned down to A. Don't mess with it, or you will need custom strings, and notes won't be where your fingers expect to find them automatically (seriously). On a standard chromatic as a base, I don't think you would have to refelt any chord you wanted to keep. You would just cut away felt to let the doubles both sound...any chord that did not call for a D# or A# but did call for D or A. Every chord on our list would qualify except C, Em. The E7 would be special in that only one of the D notes in each octave should sound as the 7th, so leave it alone, blocking the second D in each octave, what were the D# notes. It's better not to use doubles on the 7th tone. E7 is EG#BD.

So, it becomes the following, all using standard strings (*):

FGCDEFF#GAABCC#DDEFF#GG#AABCC#DDEFF#GG#AABC

If refelting every bar, note that changing #9A to G# would be an advantage for the E7 chord, especially if playing in the key of A, while a double A in that area is not essential to anything else. #9A could also become a doubled G, but I believe that gets into a need for a custom string, which is readily available in a Fladmark brand. That would make G a "power key". Having doubled root and fifth. That would be on par with the key of D with doubled D and A notes but higher up in the string set. The G would likely have a stronger bass sound. My preference is to use the G# for a stronger E7 chord and key of A.

(*) referring to Oscar Schmidt and Chromaharp standard. Be careful how that translates on a string set for an Orthey autoharp.

Addendum

In doing a CGD+E7 decatonic, the 10 note diatonic/chromatic hybrid with lockbars, I used an existing 21 bar chord set. I added 6 chords to the basic 15 and wound up with the following layout, keeping in mind that the first 15 on the right CANNOT be moved into the 16-21 area because of harmonics:

Cadd9		Gs4		CLk		GLk		G7		D7		DLk		
	FM7		CM7		F		C		G		D		A	
	Dm7		Am7		Dm		Am		Em		Bm			E7

Note that all of these additional six chords except Gsus4 are 4 note (per octave) chords, meaning that they are less likely to sound harmonics with so many notes open.

Only D lock actually has a capability to engage (lock). The other two lockbars are regular buttons and are held with the thumb.